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Facilitation of Collaborative and Contextual Learning in an Enterprise Environment

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Abstract

The aim of the work was to find a new model for facilitation of learning in modern enterprise environments. The research started from the exploration of two learning cases in different workplaces by asking three questions: 1) What were these cases: what were the goals, what happened, why, and what were the consequences? 2) How was the guidance of learning implemented? 3) What were the guidance elements which most affected how successful the different parties found the case? In the selection of the cases three items were regarded as important, firstly that there was a strong will and ability to apply the best possible pedagogical practices, secondly that the cases had experienced high-level learning guides, and thirdly that the cases represented different organizational environments. The exploration phase was implemented by applying the grounded theory method for qualitative analysis of the research data. The data was collected through observations, interviews and questionnaires.

The main findings from the exploration can be crystallized into five items: 1) strong effect of context on motivation and commitment 2) efficiency of collaboration in learning 3) inadequacy of real contexts to guarantee the utilization of learning results in the organization 4) challenges in understanding what should be taken into account concerning individuals in contextual collaborative learning 5) versatility of possible guiding interventions in a contextual collaborative learning process. The results of the exploration were used to direct a literature search for relevant theories. The main research question at this stage was: What kind of general model could support the implementation of contextual collaborative learning in an enterprise environment? This question was divided into five subquestions: 1) What kind of theoretical evidence can be found to support the importance of context in learning, and what kind of disadvantages can contextuality have? What different possibilities are there to utilize contexts? 2) What kind of theoretical evidence can be found to support the importance of collaboration in learning, and what kind of disadvantages can collaboration have? What is needed to facilitate collaboration? 3) What factors concerning individuals should be taken into account in contextual collaborative learning? 4) What is needed to ensure the utilization of learning results in the organization? 5) How should guidance be carried out? How could the entity of contextual collaborative learning be facilitated?

The framework of sociocultural constructivism was used as the main theoretical tool to answer the questions. A model for facilitation of learning was constructed by combining the findings from the empirical data and the relevant theories from literature. Finally the model was validated against the research data to ensure that it still, after modifications, was consistent with the data.

The main contribution of the study is a contextual and collaborative learning model which connects three different organizational contexts: organization level, organizational unit level, and expert community level contexts. The model consists of two parts: a problem-based learning part where basic knowledge in important areas is improved in a structured case-based way and a self-directive part, where strategic projects are carried out in groups participating in a community of practice at the same time. The model offers a framework for practical actions to facilitate contextual and collaborative learning in an enterprise environment.

Key words: organizational learning, problem-based learning, community of practice, contextual learning, situational learning, collaborative learning

Tiivistelmä

Työn tarkoituksena oli löytää uusi malli oppimisen tukemiselle moderneissa yritysympäristöissä. Mallin rakentaminen alkoi kahden eri työpaikoilla tapahtuneen oppimistapahtuman eksploratiivisella tutkimuksella etsimällä vastauksia kolmeen kysymykseen: 1) Mitä tapahtumat olivat: mitkä olivat tavoitteet, mitä tapahtui, miksi ja mitkä olivat seuraukset? 2) Kuinka oppimisen ohjaus oli toteutettu tapahtumissa? 3) Mitkä ohjaukseen liittyvät elementit eniten vaikuttivat siihen, kuinka onnistuneena eri osapuolet pitivät tapahtumaa? Tapahtumien valinnassa pidettiin tärkeänä että niissä haluttiin soveltaa parhaita mahdollisia pedagogisia käytäntöjä, että ohjaajat olivat kokeneita ja ammattitaitoisia ja että tapaukset edustivat erilaisia organisaatioympäristöjä. Eksploraatiovaihe toteutettiin soveltamalla aineistolähtöistä lähestymistapaa (grounded theory) tutkimusaineiston laadulliseen analyysiin. Aineisto kerättiin havainnoimalla, haastattelemalla ja kyselyillä.

Eksploraatiovaiheen päälöydökset voidaan kiteyttää viiteen asiaan: 1) konteksti vaikutti voimakkaasti motivaatioon ja sitoutumiseen, 2) yhteisöllisyys teki oppimisesta tehokasta, 3) todellistenkaan kontekstien käyttö ei kyennyt takaamaan oppimistulosten hyödyntämistä organisaatiossa, 4) oli haasteellista ymmärtää yksilöihin liittyvät tekijät kontekstuaalisessa yhteisöllisessä oppimisessa ja 5) kontekstuaalisessa yhteisöllisessä oppimisprosessissa oli mahdollista käyttää monipuolisesti erilaisia ohjausinterventioita. Eksploraatiovaiheen tuloksia käytettiin suuntaamaan kirjallisuushakua relevanttien teorioiden löytämiseen. Tärkein tutkimuskysymys tässä vaiheessa oli: Minkälainen yleinen malli voisi tukea kontekstuaalisen yhteisöllisen oppimisen toteuttamista yritysympäristössä? Pääkysymys jaettiin viiteen alakysymykseen: 1) Minkälaista teoreettista todistusaineistoa voidaan löytää tukemaan kontekstin tärkeyttä oppimisessa ja minkälaisia haittoja kontekstuaalisuudella voi olla? 2) Minkälaista teoreettista todistusaineistoa voidaan löytää tukemaan yhteisöllisyyden tärkeyttä oppimisessa ja mitä haittoja yhteisöllisyydestä voi olla? Mitä tarvitaan mahdollistamaan yhteisöllisyys? 3) Mitä yksilöihin liittyviä tekijöitä pitäisi huomioida kontekstuaalisessa yhteisöllisessä oppimisessa? 4) Mitä tarvitaan varmistamaan oppimistulosten hyödyntäminen organisaatiossa? 5) Kuinka ohjaaminen tulee suorittaa? Kuinka kontekstuaaliselle yhteisölliselle oppimiselle suotuisa ympäristö luodaan?

Pääasiallinen teoreettinen viitekehys kysymyksiin vastaamisessa oli sosiokulttuurinen konstruktivismi. Oppimisen tukemisen malli rakennettiin yhdistämällä tutkimusaineiston löydökset ja kirjallisuudesta löydetyt relevantit teoriat. Lopuksi malli validoitiin tutkimusaineiston avulla sen varmistamiseksi, että se on teorialisäysten jälkeenkin ristiriidaton eksploraatiovaiheessa kerätyn aineiston kanssa.

Työn päätulos on kontekstuaalisen yhteisöllisen oppimisen malli, joka yhdistää kolme erilaista organisaation kontekstia: organisaatiotason, organisaatioyksikkötason ja asiantuntijayhteisötason kontekstit. Malli koostuu kahdesta osasta: ongelmalähtöisen oppimisen osasta, jossa parannetaan tärkeiden alueiden perustietämystä määrämuotoisella tapauksiin pohjautuvalla menetelmällä, ja itseohjautuvasta osasta, jossa ryhmät suorittavat strategiatason töitä osallistuen samalla asiantuntijayhteisöjen (communities of practice) työhön. Malli tarjoaa viitekehyksen käytännön toimille, joilla helpotetaan kontekstuaalisen yhteisöllisen oppimisen toteuttamista yritysympäristössä.

Avainsanat: organisaation oppiminen, ongelmalähtöinen oppiminen, community of practice, kontekstuaalinen oppiminen, yhteisöllinen oppiminen

Acknowledgements

This dissertation has its roots in 1993 when I was leading a small consulting unit at Telecom Research Center of Telecom Finland Ltd. This unit helped the corporation's customers apply telecommunication solutions in their business. One morning I was discussing an exceptionally difficult question with a customer from the Vocational Teacher Education University. He asked how telecommunication could be utilized in learning. I started looking for persons in our unit with experience of learning applications. I found Jari Lehmonen and Terttu Rönkä, both of whom had done pioneer work in this field. Together we soon realized, however, that our theoretical knowledge base was not adequate to really understand the needs the client had. We then decided to propose a deal: if the Vocational Teacher Education University first taught us what learning is, we would after that tell them how telecommunication could be utilized in it. The agreement was made and a two-year project, called PEDATEL, started. A fascinating new world opened up to me in the meetings with Erkki Ahonen, Jouni Enqvist, Seppo Helakorpi, Jari Lehmonen, Terttu Rönkä, Matti Suonperä, and many others. Especially Professor Matti Suonperä took great interest in the project and guided me fatherly. Since then his expertise, enthusiasm, and friendship have continuously supported me. As head of the consulting unit I should not have participated in the project so intensively, but I was carried away by it. The person who understood me in this and made my participation possible was my superior at that time, Timo Rajamäki. I want to thank all the above-mentioned people for their fantastic cooperation which gave me the starting point to the professional world beyond engineering.

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Lauri Jäntti

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1 Introduction

1.1 The aim and organization of the research

This dissertation considers facilitation of learning[1] in modern enterprise environments. Its focus is on the practical actions which different interest groups, e.g. management, human resource developers, trainers, superiors, colleagues, or outside experts can take to improve learning to benefit the whole organization. Special attention is paid to contextuality and communities. The general aim was to find new information regarding how to help the integration of theory and practice in the learner's reality.

The basic idea in the research was to keep both feet firmly on the ground by having constant close connections to real working life. Therefore two learning cases in different workplaces were explored first and the results were used to direct a literature search for relevant theories. After that a learning model was constructed by combining the findings from the empirical data and the relevant theories from the literature.

This first chapter describes very generally the theoretical framework of the researcher at the beginning. In the following chapter the first research questions are presented as well as the research methods and some definitions of central concepts. Chapter 3 is dedicated to the exploration of the two learning cases, and it is concluded by presenting theories grounded as much as possible only to the empirical data. Chapter 4 starts by presenting more specific research questions based on the exploration. After that a literature review directed by the findings of the empirical data is carried out and a more sound theoretical base formed. Chapter 5 presents the model for the collaborative contextual learning by using both the grounded theories and theories based on the literature. Chapter 6 concludes the research with evaluation.

The first case started as a consultative project. Only later was it decided that it would be used as a research case. The real exploration of the first case started in autumn 1999 and the second in spring 2000. In the following the theoretical framework directing the exploration phase is outlined.

[1] At the beginning of this work learning was defined as **the process of gaining knowledge and know-how.** In Chapter 4.1 it is redefined as participation in social practice and as cognitive change within an individual. Reasons for this can be found in Chapter 4.

1.2 Theoretical framework at the beginning

This chapter has two goals: firstly, it is a short introduction to the subject, and, secondly, it describes the preconceptions the researcher had before applying the grounded theory method presented in Chapter 2.2.

An enterprise has many demands at present. Being cost-effective and profitable now does not guarantee anything for the future. Continuous development is crucial. However, if the development is only incremental it may turn out to be either too slow or insufficient. Even outstanding companies which try to take care of their competitiveness, listen to their customers, and invest in new technologies may suddenly lose their market position when a breakthrough innovation is made (Christensen, 1997). Hamel and Prahalad state that future opportunities for the company should be seen from a viewpoint which is different from the mainstream thinking and capabilities to exploit these opportunities should be built continuously. The existing competitive space should be fundamentally reinvented again and again (Hamel & Prahalad, 1994). This underscores one important need: innovativeness.

Most often continuous organizational development is based on organic growth, small incremental steps towards better performance. Organic growth calls for close cooperation and communication between the employees. The personnel is empowered to make decisions which in the past belonged to the management only (Ståhle & Grönroos, 1999). Facilitating this the flow of information between different people is extremely important. New knowledge is created through interaction between people (Nonaka & Takeuchi, 1995). The basic idea is close collaboration where unexplicit expert knowledge, tacit knowledge, can be made explicit, combined, and utilized. Organic growth needs dialogical[2] skills above all.

In addition to the creative chaos, which is the basis of innovations (Ståhle & Grönroos, 1999), and organic growth, which is needed for continuous development, mechanistic systems are also needed. For example mass production, documentation of complicated products, and some legislative issues are important functions, even if neither very creative nor necessarily knowledge-intensive. Learning and training[3] of mechanistic skills have two benefits compared to the more complicated skills: firstly, the skills needed can be defined accurately and secondly, the existence of the skills can be easily tested. Motivational issues may be challenging. Usually traditional learning and training methods are quite suitable for mechanistic needs. In an enterprise environment

[2] "In dialogue, a group explores complex difficult issues from many points of view. Individuals suspend their assumptions but they communicate their assumptions freely. The result is a free exploration that brings to the surface the full depth of people's experience and thought, and yet can move beyond their individual views." (Senge, 1990, p.241)

[3] "Training is the process of learning the skills that you need for a particular job or activity." (Collins Cobuild English Dictionary, 1995). When the word training is used in this work the mechanistic nature of learning is emphasized. The skills needed for a particular job are known or assumed to be known beforehand and the target of the training is measurable.

competence management programs are often used to define the basic skills needed for each role in the organization and provide training if needed. This ensures a good base for further personal development but is not enough if used exclusively.

It is evident that the importance to develop competences in the whole organization has grown. After Taylor's authoritative models of work division the amount of empowerment and participation of employees has gradually increased. Management by results, quality management, process management, and learning organizations are examples of that (Sarala & Sarala, 1996). All the views or frameworks of development have different emphases characteristic to the time each was developed. The more the level of empowerment increases, the more important it is that each employee understands the "big picture", the entity. Senge has called this the discipline of "Systems Thinking". It integrates the other ideas of the learning organization into a coherent body of theory and practice (Senge, 1990). He states that without systemic orientation, there is no motivation to look at how the other ideas in the framework of the learning organization interrelate.

Organizational learning is not possible without the learning of individuals. A great many different learning theories can be utilized for describing and understanding individual learning. **Behavioristic** theories, even if they are no longer very attractive in modern learning, provide models for understanding simple forms of learning such as conditioning (Skinner, 1976). As a descendant of behaviorism, the **social learning theory** (Bandura, 1986) explains more complex interaction of individual factors, behavior, and environmental stimuli. The **humanistic** approach brought forward the importance of motivation (Maslow, 1970), the facilitating and encouraging role of the teacher (Rogers, 1980), and characteristics of an adult learner (Knowles, 1984). **Cognitivism** focused on thinking and brought out the concept of schema, which helped to understand the process of perception and selection of information (Neisser, 1976). Some versions of the cognitive theory also bring up situational factors and situated cognition (Brown et al., 1989, Resnick et al., 1991, Kirschner & Whitson, 1997), although contextuality of learning is most deeply emphasized in situated learning theories (e.g. Lave & Wenger, 1991, Wenger, 1998) and activity theories (e.g. Engeström et al. 1999). **Individual constructivism** (e.g. cognitive constructivism) describes learning as an active process where the learner constructs knowledge and not just passively receives it (von Glaserfeld, 1995a), while **social constructivism** (e.g. sociocultural constructivism) emphasizes the social and culturally situated nature of learning (e.g. situated learning theories). **Experiential learning theory** (e.g. Kolb, 1984) emphasizes the role of both concrete experiences, reflective observation, and conceptualization as important elements of learning. These few examples of often referred theories show that there are many alternatives which the research can be based on. The enterprise environment outlines the focus on adult learning. Therefore models of experiential learning, which emphasize the importance of integrating theoretical aspects into actual work, and social constructivism, which emphasizes the situational and contextual nature of learning, are considered especially important.

This short introduction outlines the theoretical framework at the time when the first research questions were asked. Even if the aim was to base the exploration phase (presented in Chapter 3) on empirical data only, the framework certainly had its effects on the perceptions made, as also the theories of cognition and constructivism suggest. In the next chapter the preliminary research questions are presented, the method of the exploration is described, and some central concepts are clarified.

2 Research questions and methodological issues

2.1 Research questions

As stated in the previous chapter, the focus of the research is on the practical actions which different parties take to improve learning to benefit the whole organization. Special emphasis is on the perceptions which clarify actions and their consequences in developing expertise by integration of theory and contextual practice. These broadly defined goals were approached by exploring two practical learning cases: design tool workshops for sales support engineers (referred to later as Case 1) and an in-house business school (referred to later as Case 2). In the selection of the cases the following points were regarded as important:

- the existence of a strong will and ability to apply the best possible pedagogical practices
- the cases have experienced high-level learning guides[4]
- the cases are from different organizations (wider perspective)
- the cases represent different organizational environments (e.g. mechanistic, structured, with defined needs of knowledge, and dynamic, unstructured, with a great deal of tacit knowledge)
- possibility to participate in the events and make observations, conduct interviews, and distribute questionnaires
- the guides and experts supporting learning are willing to co-operate

Cases fulfilling these requirements were found from consultative projects in progress in 1998.

The exploration phase had three goals: firstly, to understand what happened in both cases, secondly, to understand the idea and process how the guidance of learning was done, and thirdly, to find the most important elements affecting the outcome of the case. The preliminary[5] research questions can be formulated as follows:

Table 1 Research questions

1	What were the cases: what were the goals, what happened, why, and what were the consequences?
2	How was the guidance of learning implemented in the cases?
3	What were the elements related to the guidance which most affected how successful the different parties found the case?

[4] Guide is used in this work as a general expression about a person who helps in learning.
[5] The research questions were redefined after the exploration phase (see chapter 4).

2.2 Methodological issues

The research began with the formation of theories based on observed data, interviews, and questionnaires, and then it was complemented by means of existing theories from the literature. With the help of all the theories the subject was focused on the most essential issues in learning, and a model was formed. The model was finally validated against the empirical data to ensure that the modifications based on the literature did not cause any inconsistency with the data. The structure of the research is presented in Figure 1.

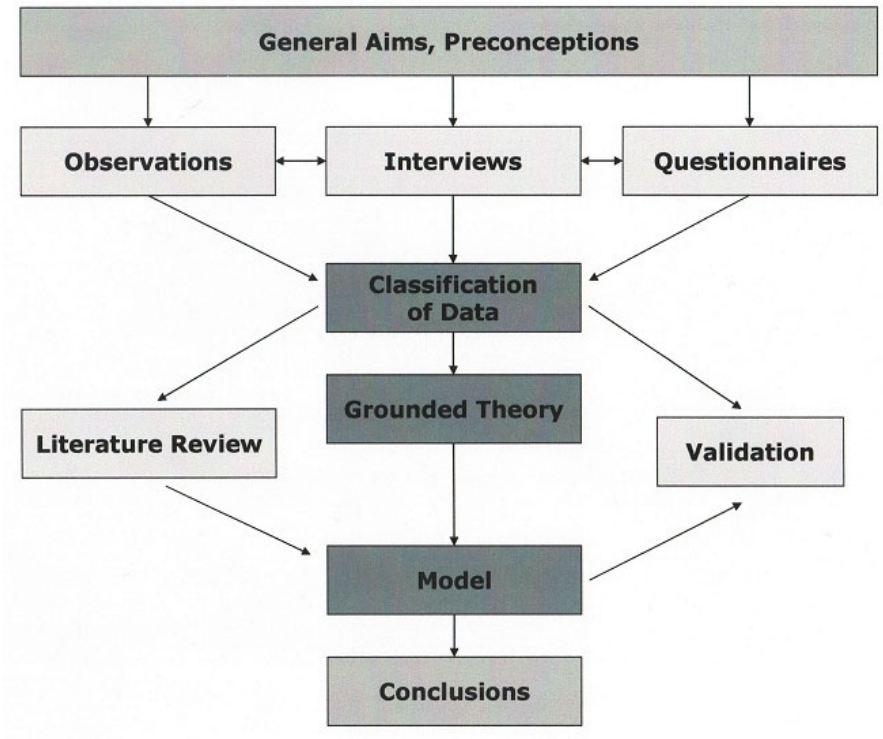

Figure 1 Structure of the research

The research questions presented in Table 1 call for several features of qualitative research (Bryman, 1989, p. 136-138):

- the researcher should be, as much as possible, an insider in the organization to be able to understand the phenomena deeply
- the context, e.g. in the organizational environment is important. Good practices in one environment can be very adverse in another environment.
- emphasis should be on process. Learning evolves with time and consists of several interventions[6], which may be very different by nature.
- the structure of the research develops all the time

[6] Intervention is the act of intervening, especially in order to influence a situation some way. (intervene = to become involved in a situation and to try to change it) (Collins Cobuild English Dictionary, 1995)

- the main sources of data are participant observations, interviews and documents

The research may be further classified as a case study. "The case study is a research strategy which focuses on understanding the dynamics present within single settings." (Eisenhardt, 1989, p.534) "A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident." (Yin, 1994, p.13) These statements apply very well to the research. Yin states further (1994, p.27) that in case studies the theory development is prior to the conduct of any data collection. Owing to the exploratory nature of the first phase of the research, only a fairly loose theoretical frame of reference (Chapter 1) was conducted before starting the first data collection. However, the second round was based on deeper theory grounded on both literature and the empirical data explored in the first phase. Therefore the research is not an orthodox case study but aims at even better results by sharpening the focus throughout the progress of the work. Having two cases does not, according to Yin (1994), appear to prevent calling the research a case study.

Also many characteristics of an action research are fulfilled (Eden and Huxham, 1996, p.539):

- the researcher was involved in intents to change the organization. He was an active participant in planning actions and tools.
- the intention was to have implications beyond those required for action or to generate of knowledge in the domain of the cases.
- the targeted research aims and intervention go hand in hand supporting each other.
- the theory developed from a synthesis of what emerged from the data and what emerged from the practical use of the body of theory, which gave the intervention and research intent
- the research process involved a series of interconnected cycles, where writing about research outcomes at the latter stages of the project was an important aspect of theory exploration and development

To fulfill the criteria of good qualitative research and ensure the validity, versatile triangulation was used. Triangulation is defined (Denzin & Lincoln, 2000, p. 443-444) as "a process of using multiple perceptions to clarify meaning, verifying the repeatability of an observation or interpretation". In the explorative research phase, three different types of triangulation were used (Lincoln & Guba, 1985, p. 305-307, Patton, 1990, p. 464-470):

- several data collection methods were adapted: observations, interviews, and questionnaires
- data was collected from different sources
- in some situations another observer was present

Lincoln and Guba state four aspects which can be used as criteria when evaluating an inquiry: truth value, applicability, consistency, and neutrality (Lincoln & Guba, 1985, p. 290). In a conventional research paradigm they have

well-known meanings of "internal validity[7]", "external validity[8]", "reliability[9]", and "objectivity"[10]. In a naturalistic paradigm, according to the same researchers, these four aspects get the following meanings respectively: credibility, transferability, dependability, and confirmability. These terms are used in this work and explained in more detail when evaluating the research in Chapter 6.2. In the design phase the following issues related to them were taken into account:

- the researchers tried to be as a natural part of the learning event as possible
- the cases were described in as much detail as facts allowed in order to make it possible for anybody to understand the context later
- every effort was made to document the research so well that the research method could be checked afterwards
- all the material was filed and is available. Most of the observed situations are on videotape and can be reviewed.

The grounded theory approach was chosen as the method for qualitative analysis because it appeared to provide good tools and systematic propagation for the analysis. The grounded theory method is a qualitative research method that uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon (Strauss and Corbin, 1990, p.24). It is based on systematic categorization of observations and results in narratives of the cases with a perfect fit with the observed data. The narratives show different factors affecting the quality of guiding and form the basis for further theory development.

The method consists of the following steps (Strauss & Corbin, 1998):

- **choosing a problem** and stating the **research question**
- **open coding** of the research data to identify the concepts and their properties and dimensions by means of categories
- **axial coding** to relate categories to their subcategories in order to discover the ways that categories relate to each other
- **selective coding** to integrate and refine the categories in order to form a theory

The **research questions** are defined in Table 1. Here it can be noticed that the questions are broad enough to be suitable for qualitative research. They are statements identifying the phenomenon (guidance of learning) to be studied.

Open coding can be said to be a discovery of concepts. "During open coding, data are broken down into discrete parts, closely examined, and compared for similarities and differences. Events, happenings, objects, and

[7] Internal validity: The extent to which variations in an outcome variable can be attributed to controlled variation in an independent variable. (Lincoln & Guba, 1985, p. 290)
[8] External validity: The approximate validity with which it can be inferred that the presumed causal relationship can be generalized to and across alternate measures of the cause and effect and across different types of persons, settings, and times. (Lincoln & Guba, 1985, p. 290)
[9] Reliability: The level how well each repetition of the application of the same instruments to the same units will yield similar measurements. (Lincoln & Guba, 1985, p. 292)
[10] Objectivity: The level of intersubjective agreement. (Lincoln & Guba, 1985, p. 292)

actions/interactions that are found to be conceptually similar in nature or related in meaning are grouped under more abstract concepts termed "categories". Closely examining data for both differences and similarities allows for fine discrimination and differentiation among categories." (Strauss & Corbin, 1998, p.102) A concept is defined as a labeled phenomenon. From several different ways of doing open coding, analyzing whole paragraphs was mostly used. Occasionally also line-by-line analysis and analyzing an entire document was used. In Case 1 open coding was carried out manually by using a word processor program. Paragraphs were selected and moved to different headings (category). In Case 2 a commercial analysis software (Atlas.ti) was chosen.

Axial coding means relating categories to their subcategories to form more precise and complete explanations about phenomena (Strauss & Corbin, 1998, p.124). The subcategories complement the phenomenon which the categories stand for, by answering questions like when, where, why, who, how etc. It is important to study both structure[11] and process[12] because they are heavily interlinked. The structure creates the circumstances and the process denotes the action/interaction over time. It is also important to make a distinction whether a category denotes a condition, an action/interaction, or a consequence. In Case 1 axial coding was carried out by means of a word processor by organizing categories and refining the headings. In Case 2 the software (Atlas.ti) was used to draw visual presentations about the hierarchy of categories.

Selective coding means integrating and refining categories so that the research findings take the form of theory (Strauss & Corbin, 1998, p.143). This final result is usually in forms of narratives and graphs.

As a conclusion of the methodology, an action research–like case study was used to achieve a deep understanding of the two different cases selected. Grounded theory was adopted to get a systematic method for the qualitative analysis of the empirical data. The preconceptions which unavoidably affect the grounded theory process are briefly described in Chapter 1.2.

2.3 Short descriptions of the cases

The first case selected was a project with an organization to develop a learning solution for its local sales support teams. The organization had developed a new process for designing and ordering a mass-tailored product complementing its earlier off-the-shelf and fully-tailored products already in production. Good methods to introduce the new design and ordering tools were needed. The project concentrated on planning, implementing, and evaluating a course for support engineers so that they would be able to use the new tools. The customer organization wanted to focus on utilizing the best possible learning methods and

[11] Structure creates the circumstances in which problems, issues, happenings, or events pertaining to a phenomenon are situated or arise (Strauss & Corbin, 1998, p.127).
[12] Process denotes the action/interaction over time of persons, organizations, and communities in response to certain problems and issues (Strauss & Corbin, 1998, p.127).

to develop good tools for that. The case represents a rather structured learning case which, however, has to give space for some creativity as well. The role of the researcher was both that of consultant and of non-participant observer. As consultant the researcher participated in the planning of the learning project which brought in features of action research. As observer the researcher attended two learning workshops making observations, interviews, and questionnaires but without being directly involved in the activities of those being studied.

The second case was an internal project at a telecommunication company (later Company) to develop an intranet-based learning environment for its Internal Business School (later IBS). IBS is intended for key experts who will play a major role in ensuring the Company's future. It is arranged twice a year and lasted at that time slightly less than a year. The purpose is to make the most essential issues in company strategy more understandable, to promote the company's change process, and to improve the facilities required for international co-operation and rapidly changing operations (Karike, 1999). The aim is also to improve in-house co-operation and networking, and to create willingness and spirit for continuous learning (Karike, 2000). The participants of IBS may live in different countries or in different parts of Finland.

The case was focused on the strategy assignments of IBS. This work was done in teams of 5-6 participants. Every team consisted of different types of people from different divisions to maximize learning and networking. The subjects of the assignments were real problems of the Company's management and directly linked to its strategy process. The strategic projects at IBS were led by a high-level expert and supported by mentors[13] who were directors and experts in the Company. The strategic projects were very demanding lasting several months and carried out together with one's regular work.

In the second case the role of the researcher was very similar to the first case. He was both consultant (features of action research) and non-participant observer. The only difference was that instead of participating in the planning of the whole course, the researcher was only responsible for implementing the intranet-based learning environment. The researcher had participated in the Business School the previous year and thus knew the working methods and content very well. As non-participant observer he participated in all the events where the leader of the strategic projects gave guidance to the working teams. In addition to these events the mentors gave varied amounts of guidance elsewhere, but this was only studied through records in the learning environment and interviews.

[13] Mentoring is the process whereby a more experienced person guides, supports and counsels less experienced persons in such a way that they achieve their personal and career objectives and become competent employees in the organisation. (Prof. M. P. van Rooy, http://hagar.up.ac.za/catts/learner/cilliers/txhrd/products/eng_in_train/1_def_mentor.htm). In this work mentors are rather defined as experts in their domains who help learners in their professional problems.

3 Exploration of the cases

3.1 Case 1: Design tool workshops for sales support engineers

This chapter describes the exploration phase of Case 1. It starts from an overall view to the research data and continues with the analysis of the material. A general description starts the analysis and then the main points of the observations, questionnaires, and interviews are described. After that the results of the open and axial coding of the research material are presented. Finally, the results of selective coding are given in forms of narratives and graphs. If the reader is not interested in the details of the case, it is possible to proceed directly to Chapter 3.1.2.5 and still understand the following chapters.

3.1.1 Data collection

The data collection of Case 1 started 11 September 1998 when the first planning meeting of the consultative project was held. After that date all the notes and minutes of the planning meetings were collected. A total of nine meetings were held before the first learning event, i.e. workshop, in April 1999. A rough description of the progress in the meetings is presented in Appendix 1. The project manager's long sick leave caused some delay in the progress.

Table 2 Data collected and used in the analysis of Case 1

Data collected	**Time**
Notes and minutes of planning meetings (how to develop training)	Autumn 1998 – January 2000
Starting interviews (5 persons from different positions)	April 20-21, 1999
Follow-up notes from course I	April 27-29, 1999
Course I interviews (1 learner and 1 observer from factory)	April 28, 1999
Starting and end questionnaires (7 learners) from course I	April 27-29, 1999
Videotapes and notes from course II	May 18-20, 1999
Course II interviews (4 learners, 2 learning guides, 1 observer)	May 18-20, 1999
Starting and end questionnaires (7 learners) from course II	May 18-20, 1999
Interview (1 expert)	June 11, 1999
Delayed follow-up questionnaire of course II	September 1999

The notes and minutes of planning meetings consist mainly of handwritten notes, there are only some typed minutes. All the interviews were audio-recorded and transcripted afterwards. The quality of the audio-recording was poor in the first interviews (April 20-21, 1999), and therefore they were not fully transcripted. The most important aspects and opinions were listed by listening to the tape and reading the notes. The first workshop was observed by two observers and by using forms that had been prepared in advance. Due to the enormous amount of information this was found so difficult that it was decided to both observe the second workshop with forms and videotape it. This workshop was not fully transcripted (about 20 hours of material) but a fairly detailed timetable of the event was constructed and the significant points were listed as possible issues for critical factors. Most of the questionnaires were given on paper and transcripted to Excel-worksheets when returned. The follow-up questionnaires were sent and received as attachment files of electronic mail, and also transcripted to Excel-worksheets. Five different types of questionnaires were used:

1. questionnaire to evaluate the starting levels, learning needs, and end levels of the learners
2. preliminary questionnaire for research purposes
3. end questionnaire for research purposes
4. end questionnaire for general feedback about the workshop
5. follow-up questionnaire to evaluate the transfer of learning or long-term results

The questionnaire forms are presented in Appendix 2.

Three different triangulation methods were used to improve the validity of the data collection process:

1. several data collection methods were used: observations (written notes and videotapes), interviews (written notes and audio recording) and questionnaires (the above mentioned five different types)
2. data was collected from different sources (learners, learning guides, management, internal experts, and outside experts)
3. two observers were present in both workshops and in some interviews

The presuppositions and general framework, which to a great degree directed the data collection process, are presented in Chapter 1 to the extent possible.

3.1.2 Analysis

In grounded theory the data is analyzed from the very beginning and the analysis drives the further data collection (Strauss & Corbin, 1998, p.42). The first interview is analyzed forming the basis for the next one which is analyzed etc. The notes and minutes of the planning meetings, observations of the workshop, and questionnaires give additional information which is added to the coding process. Therefore the documentation cannot exactly follow the actual process. It is impossible to make all the phases of different analysis explicit. To be understandable, the documentation of the analysis is divided into four different parts: notes and minutes of the planning meetings, observations,

questionnaires, and interviews. Although these are separate parts in the documentation, they have constantly affected each other in the actual research situation.

3.1.2.1 Notes and minutes of the planning meetings

This chapter is mainly based on handwritten notes of the planning meetings (Jäntti, 2000). Some minutes of the meetings were also taken but only occasionally. The timing and main results of all the events are described in Appendix 1. The aim here is to describe briefly the flow of thoughts in the planning meetings to form a basis for understanding the analysis better. The viewpoint is very subjective (mainly the researcher's point of view only), because only a few jointly approved minutes were taken.

The planning meetings started on September 11, 1998 (see Appendix 1). The driving force for co-operation was an interest in the development of new learning solutions by using modern information technology. The project was outlined first to concentrate on units which were using information technology daily. Quite many Internet-based learning environments were already on the market and the customer organization was interested in improving the readiness for self-education and self-study by utilizing the different ideas of the environments. The only thing defined about the target learners was that they were geographically dispersed around the world. The management and control of the process had to be centralized while the different tasks were to be done wherever appropriate. The customer organization already had one Intranet-based learning application, but it was more like an information system than a learning environment.

Before planning the project further, many learning solutions known by the project group were discussed in order to get ideas of different possibilities. Also a special set of learning solutions and tools from one company were studied. They included a computer-based learning environment under construction, a simulation tool to learn basic business skills and teamwork, and an Internet-based learning material on guiding learning. After this brainstorming the customer organization started to look for a suitable target for trial. In the third meeting it was decided that the target would be the training of the newly established sales support teams. A project manager from the customer organization was nominated and discussion on the required learning results and possible methods to achieve them began. Experiences from previous trainings were also discussed, and two practical problems were found: the mentors/trainers and the learners did not really have a clear understanding with each other, and the utilization of new knowledge and skills was unclear; the learners did not know sufficiently why they were learning what they were learning.

The main objective in training sales support engineers was to give them tools and know-how which would enable them to use a new alternative process in designing and ordering the product. The aim of the new process was not to replace the old processes (standard products off the shelf called Process A and

tailor-made products called Process C) but to bring a new intermediate alternative (Process B) between them. The new process was based on mass-customization, or a combination of mass production and customization. Both the sales and design in Process B products were local operations in many different countries. Manufacturing was centralized and it was not started before orders came in. Successful operations required good co-operation between sales and support. Formerly the support and design functions were centralized in a few countries but with Process B, there were hopes that local expertise on culture and special conditions would add value to the process and speed up customer interactions. The design according to Process B was well computerized but still demanded good knowledge of the building unit details and understanding of the assembly. Special software was designed to check the product design (if it was within the limits of Process B or is Process C) and to prepare the order and related drawings. Not all the catalogs were digitized at the time the study was made (May 1999). The importance of being able to distinguish between Processes B and C was stressed, because at worst the product is priced according to the simple and fast Process B, and made according to the very time consuming and expensive Process C.

Basing the learning on real cases appeared attractive. This way it would be possible to gradually proceed from easy cases to more demanding ones, and take the differences between learners better into account. It would also be possible to analyze failures made and include the "lessons learned" in the cases. The sales support engineers were found to be a good target group because they already had a command of English, and they were familiar with information technology. In addition to that, the target group was in different countries representing different cultures. It was assumed that the support engineers knew the technology fairly well and the real challenge was to get them to act in an appropriate way.

The next step was to design the structure of the learning body. The idea was to have both face-to-face meetings and distance learning. Distance learning modules would be small, essential entities that can be learned independently or with limited guiding. The requirements of the computer-based learning environment were discussed very actively. The environment would have to fit into the existing infrastructure with its databases and control systems, and it would have to be possible to measure achieved skills. One challenge was that it was difficult to release the best experts from their regular jobs, and when they were used, their ability as public performers was sometimes weak.
The main objectives of the project were defined first as follows:

- to specify the web based training concept. The specification had to include both the technical environment, the software needed, and the learning environment
- to organize a pilot course for sales support engineers
- to test the learning environment, technical solution, and user interface

However, the project team soon noticed that it was not possible to specify the learning environment without understanding the real pedagogical needs. It was not known what is important and what is not. Does case based training work at

all? What kind of guiding is needed? What kind of tools should be available in the learning environment? What kind of guiding is natural for the trainers? What kind of material is needed? Therefore it was decided that the pedagogical needs of case based training should be concentrated on first, and only after that the learning environment specified. The planning of the case based learning event started.

For practical reasons it was decided that the pilot course would be a three-day workshop in Finland. Distance learning modules were left out for two reasons: firstly, a suitable computer-based learning environment was not available for the tests, secondly, observation and finding the possible issues for critical factors were considered easier if the course was short and held in one place. The main reason for the lack of a suitable computer-based learning environment was that because of security reasons it had to be installed inside the company's intranet. This would have been possible, but to do it only for early trials was considered too expensive.

The training method was planned and it was decided that it would include several case exercises in a computer classroom. The measurable target of the training was defined to be that the participants would after the course be able to prepare a zero defect order for a Process B product within one hour. The other objectives were as follows: after the workshop the participants would be able to determine the way to fulfill customer needs with the product, they would understand the differences between Processes B and C, they would recognize market segments and their local needs, and they would know the principles of full cost pricing. The target group was product specialists, product managers, and engineers in product support. The number of participants was limited to 7-10 persons/workshop.

The main emphasis was now on planning the workshop and designing the data collection and research methods to find the critical factors with which to develop the right method and tools for efficient learning. A major question was what to observe during the course. To get a better understanding of the entity, five interviews were carried out before the first workshop. First the director of the unit responsible for the sales support in most countries was interviewed. Then the person responsible for the implementation of sales support, one marketing manager, and two tool designers (one of whom was the second trainer during the course) were interviewed. The project manager was the trainer responsible for the course and extensive discussions with him helped a great deal in understanding the problems. The questionnaires for the learners were drawn up.

The first workshop was held in April 1999. There were seven participants from three different countries (Norway, Germany, and Finland). The course started with orientation (morning) and with one case which was led quite fast by a trainer (afternoon). The next day started with reflection and a lecture about the details of the tools. The learners could use the tools (they were in a computer classroom) but the lecture appeared to proceed at such a pace that independent exploration was not possible without missing the key issues of the lecture. After the lecture the participants solved cases independently under the guidance of

two trainers. A short one-hour test was held before closing that day. The last day started with a lesson about full cost pricing. This was followed by group work simulating negotiations with the customer. The day and the workshop ended in reflective discussion. Two more interviews were carried out during the workshop.

A few corrective actions were made for the second workshop in May 1999. Working with cases was considered so useful that more time was reserved for that, and, instead of lectures about tools, the cases came first. The orientation phase was shortened and the lectures were arranged according to the needs and wishes of the learners. There were again seven participants, this time from Denmark, Hungary, Italy, and Finland. The whole workshop was videotaped because of the difficulties in the last workshop to collect all the relevant information. Also forms for handwritten observations had been made. Ten more interviews were carried out during this workshop. The idea to increase the time for cases appeared to work, but some software errors in the tools caused problems. Another problem that arose was that the most advanced learners needed so detailed product information that the trainers could not help them. The trainer tried to get support from experts, but did not succeed very well due to lack of time.

The experiences and material collected from these two workshops were then analyzed and discussed in planning meetings. It was decided that a follow-up questionnaire would be made for both the learners and their superiors to see the effects of the workshop in daily work. One additional expert interview was also carried out.

3.1.2.2 Analysis of observations

The first workshop in April 1999 was observed by the researcher and an outsider observer. To make the observation useful, it was decided that the following six points, which were considered helpful in answering the research questions (see Chapter 2), would be concentrated on:

1. what the learners consider important
2. what the trainers consider important
3. how clearly the trainers explain the issues being dealt with (emphasizing, giving examples etc.)
4. how a common language is achieved to make co-operation possible
5. how the achievement motivation[14] of the learners is supported by the trainers
6. how the individual differences in levels of knowledge and skills, and in personality are taken into account

[14] The achievement motivation is cognitive motivation (striving toward being a competent member of society) which is based on the internal needs that are important to a person. It links specific goals, the planning and effort needed to attain them, and feelings of self-worth. It is related to self-esteem and aspiration (the expectancy-level of personal achievement). (Zimbardo, 1995, p.375-382)

A form with a column for each item was prepared beforehand. The workshop was also partly audiotaped but the tapes were very difficult to analyze because of the high noise level and the fact that one could not see what was happening.

The forms were difficult to fill in. The best benefit they gave was that they acted as reminders of what was to be observed. In the actual situation the amount of information was so extensive that the observers could not decide fast enough into which column the observations belonged. They just took down notes and tried to concentrate on the most essential things. Very soon it became evident that the next workshop must be videotaped.

The observations made during the first workshop can be compressed into the following:

- the learners had excellent motivation. They really wanted to learn (point 1).
- during the orientation phase the trainer was able to create a relaxed and positive atmosphere by giving time to the participants to tell about their experiences and problems, and what they wanted to learn (points 4 and 5).
- the learners filled in the questionnaire to evaluate the starting levels (points 1, 5, and 6) and the preliminary questionnaire for research purposes during the orientation phase. It would probably be more beneficial to do this before the workshop in order to have more time to take the different needs into account, or even select the participants according to the answers.
- the orientation phase continued with discussion about the delivery process and what is needed to make it successful (point 2). This discussion appeared to create a common understanding of the whole system and its essential concepts (point 3). On the other hand, it also appeared difficult to outline the discussion so that it would not ramble too much. The target of the discussion should always be clear. The way to handle issues could have been more problem-oriented.
- one of the participants was from a sales organization. He brought in very valuable new viewpoints which the technical people would probably not have got without him. It would be good to have at least some learning interventions together with sales and technical people (point 4).
- the orientation phase was rather long, lasting the whole morning (taking into account that the whole workshop lasted only three days) (point 2).
- the lecture on one software tool (point 2) in the afternoon of the first day was very clear and contained some entertaining elements as well (point 3). However, it proceeded on the lecturer’s terms and the learners appeared to have no time to think about the issues themselves (point 5) even though the lecture was based on cases. The main idea became clear; what the tool was for, but no skills how to use it were developed. Some material about the topic was distributed (point 3).
- the second day started with reflection on the lecture on the software tool (point 3). This appeared to clarify things further for the learners and finally gave them an opportunity to talk (point 5).
- a fast proceeding lecture about another, more important software tool (point 2) took place in a computer classroom where the learners had the opportunity to use the tools. It should have been slowed down to give the learners more time to explore the program. The lecturer did not appear to

notice that the learners could not follow and that some of the learners did not listen at all (point 5).
- when it was possible to solve cases independently under the guidance of two trainers, the same lecturer gave excellent support to the learners and was able to create both good contacts and a good atmosphere (point 3, 5, and 6). Learners appeared to like this kind of guiding the most.
- the software and exercises used during the course should be carefully tested beforehand. Now there were too many errors which took a great deal of time to work out (point 5).
- a group work of simulated negotiations with the customer (point 2) appeared to work well in general. However, the work did not require participation from every learner and could lead to bystanders who do not learn in the best possible way (point 5 and 6).
- the test produced different prices for the same customer specification. It could be useful to discuss the results more and find the reasons for different prices (point 1, 2, and 3).

The second workshop in May 1999 was observed by the same observers as the first one. Now the substance was more clear to the observers and the observed points were developed more towards the guiding process. It included the following six points (formed intuitively based on experiences from the first workshop):

1. trainer / learner contacts and how trainers differentiate learners according to their knowledge and skills
2. flexibility of the trainers to change methods, program, experts, etc. to achieve the best possible learning results and the general ability to make things to run smoothly
3. how clearly the trainers deal with issues, express goals, and support orientation
4. discussion between the learners
5. how much the trainers get the learners to do different tasks (instead of lecturing or showing)
6. assessment of learning (clarification of the learning results and effects).

Forms for the observations were made beforehand again. One observer used the forms and the other one videotaped the workshop. Afterwards the videotape was analyzed by writing down the noteworthy events, the categories they belong to, and exact times when they happened. The transcription was not found useful or necessary.

The observations made during the second workshop are grouped below according to the above-mentioned points. They can be compressed as follows:

1. Trainer / learner contacts and how trainers differentiate learners according to their knowledge and skills

Learning by doing succeeded much better than on the previous course. The learners started working with software tools without any lectures at 10.40 am on the first morning, and one or two trainers were available for guiding almost all

the time. The orientation phase was shorter, about one and a half hours, but it appeared to work well enough to create a good atmosphere and an understanding of different needs. The trainers appeared to have no difficulties in establishing rapport with the learners. They walked around and asked questions (formative evaluation), and helped in solving real problems faced by the learners. Many times a learner came to the trainer and asked for help.

One of the learners already had a long experience of using the tools, and some of his questions were too difficult for the trainers. They tried to get help from experts, but succeeded only partly. Probably thanks to the good atmosphere, this advanced learner helped other learners very much. As an experienced user he was a valuable additional guide and could complement the trainers in many ways. The trainers appeared to have no problems in accepting that.

Possible critical issues here could be the selection of participants so that differences in knowledge and skills are small enough, and the arrangement of the availability of experts either on site or having access to them via telecommunication. Creating a relaxed atmosphere is probably important because it lowers the barriers to discussion. To achieve this the trainers were informal (e.g. had coffee when speaking, spoke from different places, joked, came to the learners etc.) and showed interest in the participants and their problems. However, to generate discussion in this kind of learning (learning by doing) where everybody faces the same problems and has to solve them themselves did not appear to be as difficult as in more ordinary lecture-based training.

2. Flexibility of the trainers to change methods, schedule, experts, etc. to achieve the best possible learning results and the general ability to make things to run smoothly

Flexibility is needed in differentiation, i.e. every time when the trainer adapts to the needs of the learner. One example of flexibility was a problematic issue in the beginning; the marketing manager was not able to use the computer. He was then transferred to share a computer with his compatriot and work in pairs. Additional needs concerning marketing material, installation and product details were fulfilled at least partly by changing the program of the last day. Some additional material was copied, and concepts clarified.

A tangible sign of flexibility was that there were many continuously varying groups of learners discussing and learning from each other. Groups from two to five learners had discussions together, sometimes with the trainer and sometimes without. After clarifying the problems at hand they returned back to their computers and proceeded with their work.

Learning by doing calls for a great deal of flexibility from the trainers. However, they appeared to have no problems. They showed no signs of stress (e.g. impatience, anger, or fatigue). The reason for this may be that they were able to create an atmosphere where everyone helped each other. If the trainer was not

available at the moment the learners needed help, they asked someone else. The size of the group (seven) appeared to be right for one trainer, who got help from another trainer about half of the time.

According to the observations, possible critical issues could here be that the trainers have no unsolved problems of their own, their self-esteem is in order, and they are in good condition mentally and physically. In addition, the ultimate goals should be kept in mind clearly. The broader the trainers' collection of "guiding tools" (mental and physical tools for guiding) is, the easier it is to be flexible. If the trainer has no guiding experience, a good rule of thumb could be to give hints only, not to do things for the learner (e.g. touch the learner's computer).

3. How clearly the trainers deal with issues, express the goals, and support the orientation

The orientation phase at the beginning of the workshop lasted about one and a half hours. The trainer first said a few words about himself and then the learners did the same. After each person's presentation the trainer asked at least one complementary question. The backgrounds and present tasks became clearer, and, as already mentioned, a good, relaxed atmosphere was created. One reason for this may be the informal behavior of the trainer. Other observations under this heading were viewing the program carefully together, discussing goals, drawing on the whiteboard, defining different kinds of concepts clearly, asking focusing questions, checking some unclear details, drawing conclusions, asking reflective questions, showing pictures, stressing important details, answering questions, comparing results, and arranging expert lectures. One of the most successful learning interventions appeared to be the test when each learner made a quotation. The trainer collected the calculated prices on the whiteboard and the group discussed the differences and reasons for them. Co-operation between the trainers appeared to work especially well when one of them was leading discussion with the other one drawing on the whiteboard and clarifying.

Possible critical issues here could be the trainers' ability to understand big entities and goals of the learning. The trainers should be able to show how the problem at hand is connected to a larger entity, and, on the other hand, how the problems can be divided (if possible) into smaller parts and analyzed.

4. Discussion between the learners

While working with cases, learners discussed the issues eagerly. Most of them were between two learners but more than 10 spontaneous group discussions between three or more learners were observed. The subject discussed was usually a problematic detail in the case or an illogicality in the software. The structure of the classroom and the size of the group supported discussions well. One could easily turn around and say something to the others. The learners were

seated close enough and had no separating walls between each other. No signs were observed of somebody suffering from noise created by discussion.

Critical may be that the cases are interesting and from real life situations, and that informal behavior is allowed. The place should be arranged to support interaction and the size of the group must be small enough.

5. How much the trainers get the learners to do different tasks (instead of lecturing or demonstrating)

According to the observations, tasks given by the trainers included filling in the questionnaires, problem solving in cases, detailed tasks to help understand something, tests, evaluation of results, and reflection. The observers expected to see the trainers doing tasks or parts of the tasks for the learners, but this did not happen. Sometimes the answers were unnecessarily direct ("put that value there" instead of "this field in the program exists because…") but mostly the trainers gave hints or answered with questions helping participants to look at the problem from another perspective. The role exercise appeared to activate learners better than in the first workshop because this time the tasks were given to individuals, not to teams.

A possible critical issue may here be that the trainers remember the method of learning by doing, that it is up to the learner to try, make mistakes, and learn. The trainer should only give hints and good viewpoints.

6. Assessment of learning

Assessment of learning was observed mainly in tests, reflections, and when the cases were discussed after having finished working with them. At times assessment was also evident when the trainers walked around and asked how the learners had solved some details of the cases. This was useful for the individual learner, but not all the good solutions which came up were shared with other learners. The tests appeared to work well allowing the learners to compare the results and discuss them. This gave the trainer an opportunity to reassess his own evaluation.

Critical issues here could be that there is some kind of assessment of learning. Learners need to understand how they have developed during the workshop, and trainers need to understand how to develop the course further. The best solutions that come up in evaluating should be shared with the whole group.

3.1.2.3 Analysis of questionnaires

As mentioned earlier, five different types of questionnaires were used:

1. questionnaire to evaluate the starting levels, learning needs, and end levels of the learners

2. preliminary questionnaire for research purposes
3. end questionnaire for research purposes
4. end questionnaire for general feedback about the workshop
5. follow-up questionnaire to evaluate the transfer of learning or long-term results

Questionnaires 1-4 were carried out in both workshops. The questions were not exactly the same in the first and second workshop because the forms were developed after the first one. Questionnaire 5 was carried out in August-September 1999. The intention was to reach all the learners and superiors of the learners (with separate forms) who participated in the five workshops in Spring and Summer 1999. The questionnaire forms used in the second workshop and in the follow-up questionnaire are presented in Appendix 2. The main results of the questionnaires in the first workshop are briefly presented first and after that the results of the second workshop in more detail.

Analysis of the questionnaires filled in during the first workshop revealed the following points:

- the course objectives were not in accordance with the needs and skills of the learners. In the course evaluation the mean value on the scale 1-4 was 2.4 (4 x 2 and 2 x 3).
- the point "the course objectives were achieved" was slightly better, the mean value being 2.7.
- the expectations of the course included learning the tools (all the learners), understanding the processes (four learners), knowing the products (three learners), and teaching others the tools (three learners).
- two participants were mainly interested in the whole process and the others mainly in the tools.
- learners would have liked more short tasks with tools from easy to more demanding.
- the slowness of the data conversion process frustrated the learners
- learning by doing was mentioned by five learners when characteristics of efficient training were asked. This supports the observation that the method works.
- the answers to "how do you learn best" included "by doing" or "with self studies and questions" (six learners). One preferred "ordinary classes interrupted with group sessions and test of skills" (direct quotation).
- the most important properties of a good trainer (mentioned by three learners) were that he is up-to-date on the topics and can be easily understood, speaking English clearly.
- "what would have been a more efficient way for you to learn" included the following answers (direct quotations): "more practical cases (maybe copies from normal orders)", "more calculating in the tool with some predefined products as a task. Find the right price", "perhaps not so many discussions and fulfilling questionarys but more skills in order to learn working with the tools", "more tasks and different examples on paper". These appear to support case-based training and learning by doing as well.

The questionnaires of the second workshop were analyzed in greater detail. The learning needs and corresponding learning results evaluated by the learners are summarized in Appendix 3. The main interest was if progress really happened in the areas where the needs were the highest. To help evaluate that, three variables were defined (see Appendix 3.1): Reference Figure (RF), Progress Figure (PF), and Benefit Ratio (BR). The Reference Figure represents the need and gives a reference point for the learning. It can be compared to the learning progress described by the Progress Figure. All the figures are relative figures, which are based on the learners' own evaluation of their needs before the workshop and level of knowledge and skills after the workshop. The learner's main area of responsibility was weighted by the factor two compared to the area where the learner had only support functions. The Benefit Ratio tells how the needs were met during the workshop. If the ratio were 100 %, it would mean that all the learners had made some progress in all the expressed needs in their main responsibility or support areas. 0 % would mean that none of them had made any progress in the important areas where they had needs. In the main areas where learning was needed most (highest Reference Figures), the Progress Figures and Benefit Ratios presented in Table 2 were calculated (see Appendix 3.2):

Table 3 Progress Figures and Benefit Ratios of the learning areas

Learning Area	Reference Figure	Progress Figure	Benefit Ratio
Product details	8.5	4.0	47%
Sales (tendering) (order bound)	8.2	4.6	56%
Tendering/sales (non-order bound)	7.0	5.0	71%
Ordering (non-order bound)	6.5	1.5	23%
Ordering (order bound)	5.5	2.0	36%
Consulting	4.4	2.3	52%

The results show that product details were needed most. However, the best progress was made in non-order bound tendering and sales. According to these figures it would be expected that criticism would mainly be focused on product know-how. Learners' comments in writing support this. Product features were mentioned by four learners when expectations at the beginning of the workshop were asked. Product know-how was mentioned five times as one of the mostly needed items in daily work. In the end questionnaire, products were mentioned three times as an item which the learner did not learn. In free comments it was mentioned twice: "I expected to have at the beginning of the course some technical information about the product" and "I was looking for more detailed info about the product" (direct quotations).

Learning the tools was the most expected skill from the workshop (five learners) and they appeared to get what they had wanted. When asked "what did you learn", tools were mentioned by six learners. A serious weakness, however, appeared to be that the drawing software was not installed in the computers and the learners could not practice with it. Drawings were mentioned three times

both in expectations and in items not learned. One comment stated: "The VERTEX APT (the drawing software) missing is a big loss. The overall picture of the benefits for ESC-tools was lost because of that" (direct quotation). Altogether drawings were mentioned in some form by five learners. Lack of drawing programs decreased the Benefit Ratio of order-bound ordering. The Benefit Ratio of the non-order bound ordering is low because tools customization was not included in the workshop at all even if it had been requested.

Five learners answered the question "how do you learn best" by saying "doing real cases". Three learners wanted to do the performance evaluation through simulation or case-based tests. An interesting point of view was to evaluate the performance through customer satisfaction (two learners). One answer to this question was very thorough: "Performing a real order, - starting with pricing, doing the project, visiting the site during erection, taking part of commisioning/handover, being informed about the financial result of the project comparing precalculations and offer calculations." (direct quotation)

In the evaluation of trainers the lack of product experts was mentioned by four learners. Three learners praised the trainers and five learners mentioned positive performance.

The numerical values given in the end questionnaire for general feedback about the workshop are in accordance with the above-mentioned results. No statistical conclusions can be drawn because of the small number of learners. The missing drawing software, some difficulties in giving detailed product information, and problems with data converters (many errors which took time to work out) may have led to the fact that the mean value of how the course objectives were achieved was rather low, being 2.4 (on scale 1-4). Training methods got a mean value of 2.7, which is low in the light of the free-form answers. The atmosphere had a good value of 3.3. The objectives could have been better in accordance with the needs and skills of the learners on the basis of the mean value 2.7 (3 x 2, 3 x 3, 1 x 4). The numerical results of this questionnaire are summarized in Appendix 3.3.

The intention was to send the follow-up questionnaire (see Appendix 2.5) to each participant of all the workshops held in Spring/Summer 1999, and their superiors. They were posted in August 1999. Probably because of some misunderstandings no participant forms were returned. Instead, 14 superior forms were returned. One of them was empty, one from a superior, and the others (12) from participants. The superiors may have given their forms to participants not noticing that they were intended for them. One of the respondents attended the first workshop, two of them attended the second workshop, and the others attended the later workshops not observed by the researcher.

Even if the questionnaire did not succeed, some conclusions can be made (see the distributions in Appendix 3.4):

- it is evident that learners felt that they had learned at least something about tools in the workshops

- the home units were not very well able to utilize the knowledge and skills gained in the workshops
- it appears that the workshops will not help Process B become more common
- it is not sufficient to ask about results only immediately after the workshop

The free-form questions revealed nothing new. The answers concerning e-mail and Internet were not taken into account because the answers were given by e-mail. It may be possible that those not so much in favor of e-mail and Internet did not answer at all.

As a conclusion, the questionnaires gave the following main results:

- the main goal, learning to use the tools for Process B, was achieved
- more product knowledge should have been available
- case-based training and learning by doing were good methods
- the tools should be complete (the lack of the drawing program caused dissatisfaction)
- the tools should work without problems
- the knowledge and skills achieved could not be used very well after the workshop
- the workshop did not appear to help Process B become more common

Possible issues for critical factors could thus be the following points:

- the training should be based on real life situations
- experts should somehow be available during the workshop
- the tools should be complete and carefully tested before the workshop
- the facilitating factors should be taken into account (e.g. if there are no tools in the learner's home unit, it is not worth learning to use them)
- the superiors of the learners should be involved in the definition of the learning needs

3.1.2.4 Analysis of interviews

The interviews were analyzed together with the findings in the previous chapters. The interviews and these findings were the source of information for the qualitative analysis using Grounded Theory methodology. Open coding was made by reading the transcripted interviews several times and extracting different kinds of opinions and statements as direct quotations to a new document. The quotations were given a heading stating the idea briefly. For example the quotation

"*I think that one could consult some of the specialists with the product and make them to generate projects which should be done here.*"[15] was given the heading

[15] Quotations are direct quotations with the exact spoken words if not otherwise stated. If the quotation is a translation from Finnish to English, the word "translation" has been added.

"Experts' participation in planning", and the quotation "*…the best way of learning things is by doing. Learning by doing."* was given the heading "Case-based training as a method"

After dividing all the transcripted documents into paragraphs with headings, axial coding started. The same kind of opinions or statements were grouped together and given a higher level heading. For example, after axial coding the second of the previous examples was among a number of similar kinds of opinions. It was put under the following higher level heading:

Higher level heading (corresponds to category) -> Guidance
Medium level heading (heading of subcategories) -> Implementation of guidance
Lower level heading (subcategory) -> Case-based training as a method

The following are some examples of quotations under this heading:

"*I think the kind of course* (case-based training) *is ok. …the best way of learning things is by doing. Learning by doing." (Learner 1)*

"I like this kind of training (case-based training) *because you can meet immediately problems that you maybe can meet in a week or in a month." (Learner 2)*

"… I have not seen this kind of group before; they had to be told three to four times to have a coffee break before they went … that is also one sign that they enjoy working this way…" (External observer, translation)

"…this is better because everybody can adopt his own pace and is able to think about what he is doing…" (Learning guide, translation)

"It (case-based training) *is very good and very practical. I mean I can sit here and try everything, every option and solve the problems myself or with help if necessary, and this method is much better than just see somewhere or just if somebody is standing at the blackboard and just showing everything… but if I can do and touch this is more personal I think…" (Learner 3)*

The most essential points of the other material (notes and minutes of the planning meetings, observations, and questionnaires) were added, if not already included in the interview material.

After the axial coding of all Case 1 material, the main structure (without the actual quotations) was as follows in Table 4:

Table 4 Main categories after axial coding of Case 1 material

Learner and his work community (category) (the dimensions through which learners' work community and personality affect the success of the guidance)
Learner's work community (heading of subcategories)
Level of basic knowledge and skills (subcategory)
Type and speed of feedback
Sharing of knowledge
Flexibility of organization
Superiors' knowledge and skills
Learner's motivation
Source of motivation
Goals of the whole program and goals of the workshop (the dimensions through which the goals affect the success of the guidance)
Properties
How revolutionary the goal of the whole program is
How difficult the problems to be solved are
Speed of action (how fast the actions needed to learn are)
Number of interventions needed to achieve the target
Timing of interventions
Indicators when the goals are achieved
Share of knowledge which may be difficult to specify in the entity (tacit knowledge)
Know-how
How deep understanding is needed
How wide understanding is needed
Need for questioning
Need for search of information
Need for networking
Preconditions for learning
Need for orientation
Need for learner's own activity
Need for expert support
Need for support material
Need for discussion
Possibility to learn in the workplace
Guidance (central category)
Quality of planning
How well should the trainer know the cases and how well should the cases work when training
Trainers' participation in planning
Experts' participation in planning
Recognition of the needs for learning
Knowledge of trainers
How wide knowledge the trainers should have

How deep knowledge the trainers should have
Skills of trainers
Creation of atmosphere
Communication and interaction skills
Versatility of methods
Trainers' personality and motivation
Readiness for self-directive work
Implementation of guidance
Personality in guiding
Experiences in learning
Depth
Amount of discussion
Flexibility
Amount of reflection
Creation of activity
Ratio between face-to-face meetings and distance learning
Amount of support after the event
Case-based training as a method
Support in addition to the guiding
Amount of expert support
Support for superiors to gain from the learning results
Learning community (the dimensions through which the learning community affects the success of guiding)
Properties of learners
Differences in levels
Differences in backgrounds
Properties of community
Possible working styles
Knowing the fellow learners
Size of the group
How the learners are selected into the community
Utilization of tools and premises (the dimensions through which tools and premises affect the success of guiding)
Suitability of tools and premises
Support for the learning method
How stimulating the tools and premises are
Suitability for distance learning
Necessity to use tools and premises
Necessity to use tools and premises to achieve the goals
Usability of the tools and premises
Applicability of the tools and premises
Possibility to use tools and premises in normal work
Security of tools and premises

Table 4 was the basis for the selective coding, i.e. integration of categories to formulate a theory. This final step of the Grounded Theory process for Case 1 is presented in the next Chapter 3.1.2.5.

Open and axial coding was done twice because the first attempt did not produce a sufficiently strong ground for selective coding. The properties and dimensions of subcategories could not be defined first, and therefore it was impossible to integrate them into one theory. The second attempt succeeded by defining the dimensions for each subcategory as soon as the categories were chosen. As can be seen from Table 4, five main categories rose from the material: learner and his work community, goals, guidance, learning community, and utilization of tools and premises. The following short summary of each category is based on the properties and dimensions of the subcategories.

3.1.2.5 Summary of each category

Learner and his work community

Engineering Support Center (ESC) is a fairly new concept. The centers will be located all over the world, the total number being 10-15. The most important partners of an ESC are the local sales organization, and the Customer Service and Order Engineering in Finland. It also has close contacts with the local customers. The structure of the organization is not strictly defined. Local conditions and culture can be adapted with the organization providing that the interfaces between the co-operative units remain untouched. A major challenge is to change the sales organization utilize ESCs because they are used to selling tailor-made products, and operating directly with the Order Engineering unit in Finland. They should understand the benefits Process B gives them: much shorter planning and delivery times, and therefore the possibility to make better profit.

In an ideal ESC the differences in levels of know-how are small. Everyone should be capable of performing each other’s tasks. However, working in teams is not very common in the organization in general, and the individuals may find it difficult to co-operate. They are not used to learning in teams either.

The individuals’ capacity for self-directed learning appeared to be good. When the trainers had no time, the learners looked elsewhere for answers. The source of motivation was more intrinsic than extrinsic on the basis of the enthusiasm they showed. From the viewpoint of personality and motivation the selection of participants was successful. However, these traits were not taken into account purposely; the process appeared to leave out the unsuitable persons, or it may just have been good luck.

Goals

The target of the workshop was to learn to use the tools and in this way advance Process B planning in ESCs. The target know-how and skill level were defined to be achieved if the participant could design an error-free product in accordance with Process B within one hour. All the skills and know-how needed for this cannot be defined explicitly. However, there are good cases which can be used in learning and which include the tacit knowledge needed. It would be possible to also use real cases which the learners could bring with them to be solved during the workshop. As mentioned earlier, there are no strict rules as to what kind of processes there should be in an ESC. Tools are the core because they ensure that the interfaces are correct. Co-operation and networking with the sales organization are highly important but they were not included in this workshop. Only a few aspects of co-operation came up in the exercises.

The problems faced in ESCs vary from simple to extremely complex. The trainer can often give immediate help, but time to think over the problem is sometimes needed. An ESC could also have an additional role as a training place. It would be one of the best learning places in the organization for young talents. When designing learning interventions to help ESCs function better, experience from design and real substance are needed. This also applies to communication and interaction skills because one has to be able to follow and understand the discussion and the planning process to be able to help. Indicators for the level of communication and co-operative skills are not defined.

Characteristic of an ESC is that knowledge and instructions received from Sales or customers should always be questioned. The process is iterative, and the first data given by the customer or sales organization seldom leads to an optimum solution. Therefore the entity must be seen and understood in depth. Fast actions are needed because the customer usually wants a quick response to his plans and specification. It is also important to keep the salesperson up to date about the different possibilities, prices, and delivery times. Sometimes the support person can save a great deal of money and time by proposing minor changes which change the manufacturing process from C to B. Some indicators describing ESC operations are monitored: share of Process B products, number and type of claims, and punctuality of deliveries. It is obvious that a single workshop is not enough to achieve the required level of operation. Several interventions and continuous support are needed to learn and understand the entity.

As it is important to understand the entity, the learners must be willing to handle big entities. Most learning happens by working, but to become a good support person, special efforts are required. Basic skills how to use the computer are needed because the tools are based on computers and the needed active information retrieval is often made by computer. During the workshop different kinds of experts should be available at least via telecommunications. The trainers can usually answer most of the questions, but for example the product details often require an expert. Externalization by means of discussion and

reflection appears to be crucial. Good orientation also showed its strength. To guarantee easy conversation and the quality of guiding the learning group should not have too many persons. Seven people appeared to work very well with two trainers. It is also important that the target of the workshop is understood in the same way. This requires good information on the targets and prerequisites beforehand. Sometimes it is difficult to learn at the workplace due to the heavy workload and unfavorable environment. If distance learning is used, separate quiet places for individual learning and team learning should be reserved.

Guidance

Training and guiding ESCs is very demanding. Trainers did not know about the learners and their special needs before the workshop and they were not able to prepare for support. Therefore, information could be collected when the learners are enrolling or showing interest in the event. It would be worth considering that the superiors of the learners somehow participated in the definition of personal targets. It would then be more probable that the learners got support in using the knowledge and skills after the learning event. The trainers or guides should be able to create a good atmosphere for learning and they should have versatile communication skills. This applies, of course, to every kind of training, but when the success depends on the level of discussion and externalization, these skills are vital. The trainers should have a fairly good general knowledge of the whole area and understand the required impacts on business objectives. In-depth knowledge of details can be left to experts but the availability of experts must be ensured.

Deep understanding requires personal guidance; mass training is not possible. Experiential learning through cases turned out to be good compared to only following by listening and watching. The guides were good in supporting reasoning by asking questions and not giving easy answers. They were flexible in adapting to the different needs of the learners. Plenty of time for reflection appears to be useful.

Facilitating factors should be taken into account as well. It is, for example, not very practical to study the tools before they are available at the workplace. In an optimum situation, the discussion and transfer of knowledge continues after the workshop. Face-to-face meetings appear to be needed from time to time but different kinds of communication tools can be used in between. However, if the superior of the learner does not support the new operation mode, all the efforts are easily wasted.

Learning community

In the workshop the learners appeared to be satisfied with the learning method which gave them freedom to learn at their own pace. There was a great deal of discussion within the group. Levels of know-how and skills differed greatly. The participants were clearly not selected according to their experience. Their

backgrounds differed also, which had its advantages and disadvantages. Valuable viewpoints were presented but the trainers had a hard job trying to offer everybody suitable guidance. The atmosphere within the group was relaxed and encouraging probably due to good trainer attitude. Feedback was insufficient because of the unclear error codes of the software and the slowness of the data conversion process. The feedback given by the trainers could not cover all the aspects. In normal ESC operations good networking with local sales, Customer Service, and Order Engineering appears to be essential to keep the feedback delays short.

Utilization of tools and premises

The tools and premises should support the learning method selected. When designing Process B products, the tools must be used because it is the data conversion which finally shows if the parameters really meet Process B requirements. However, the tools in the workshop were not ready. They aroused enthusiasm but the number of error messages without knowing the real reason for them, caused disappointment. The basic design was good because the user interface worked well. The tools provided no special support for teamwork.

One benefit in using the tools in the workshop was that it was rather easy to follow where the learners were going in their cases. This was one factor facilitating good guiding. It was also possible to store the situation on a disc and give it to the trainer.

3.1.2.6 Selective coding and summary of Case 1

Selective coding started by choosing a central category representing the main theme of the research. The category "Guidance" was a natural choice because it explains in a single word the essence of the research. It also fulfills the following criteria for choosing a central category (Strauss & Corbin, 1998, p.147):

1. It is central so that all other major categories can be related to it.
2. It (via its subcategories) appears frequently in the data.
3. The explanation that evolves by relating the categories is logical and consistent. There is no forcing of data.
4. The name used to describe the central category is abstract and can be used to do research in other substantive areas, leading to the development of a more general theory.
5. The theory grows in depth and explanatory strength when the concept is refined analytically through integration.
6. The concept is able to explain variation as well as the main point made by the data.

The integration of categories to form a theory was carried out by utilizing several techniques mentioned by Strauss and Corbin (1998, p.148): a storyline was written, diagrams were drawn, and memos were reviewed. The process was difficult and time consuming. First the level of abstraction was raised by using

higher level headings for the over 60 subcategories found in axial coding. Then a preliminary formulation of the storyline was drawn up by writing a few sentences about the entity. Memos and raw material were reviewed to find the most essential categories and how they were related to the central category. The diagrams were used to visualize the interrelations between the categories. Different colors indicated if the category represented a condition, action, or consequence. Several small theories were described in the diagrams trying to explain what actions under what conditions were needed to achieve certain consequences. These pieces were then put on one paper and combined. This way it was possible to see how the entity was formed.

The first research question (what the case was) and the second (how the guidance of learning was implemented in the cases) have already been answered in depth. The third question (guidance and a successful case; what elements different parties considered important in a successful case) still needs some elaboration. The theory development was focused on this subject.

The theory grounded on the empirical data of Case 1 is divided into four parts: general facilitating factors for effective group learning, guidance of case-based group learning, introduction of the developed expertise into normal work, and mechanisms affecting the outcome at the organizational level. The last part considers the effectiveness of not only observed interventions but also other interventions targeting at the introduction of Process B. The observed interventions dealt with tools facilitating Process B. Therefore one could presume that other interventions needed to prepare the ground for Process B would already have been done. This way the participants would have been able to start or continue using the tools immediately after the workshop and the transfer of learning would have been the optimum. This was, however, not the case, and the reasons for this are also worth considering. All parts of the theory are visualized in figures showing conditions, actions, and consequences. Some points can be conditions and consequences at the same time. Arrows are used to describe the main causal relations. However, there are so many interacting variables that it is impossible to include all the relations in the figures. Only the most important relations arising from the research material are presented.

Part 1: General facilitating factors for effective group learning

According to the research material, effective group learning calls for several conditions. Trainers should have good guiding skills, learners should have relatively small differences in their knowledge and skills, each participant should have certain preliminary knowledge, the group should be small enough, premises should be suitable, and the used tools should support group learning. Enrichment can be achieved by selecting people with different backgrounds. This was evident in both workshops where one participant was from the sales organization whereas the others represented engineering. In the observed

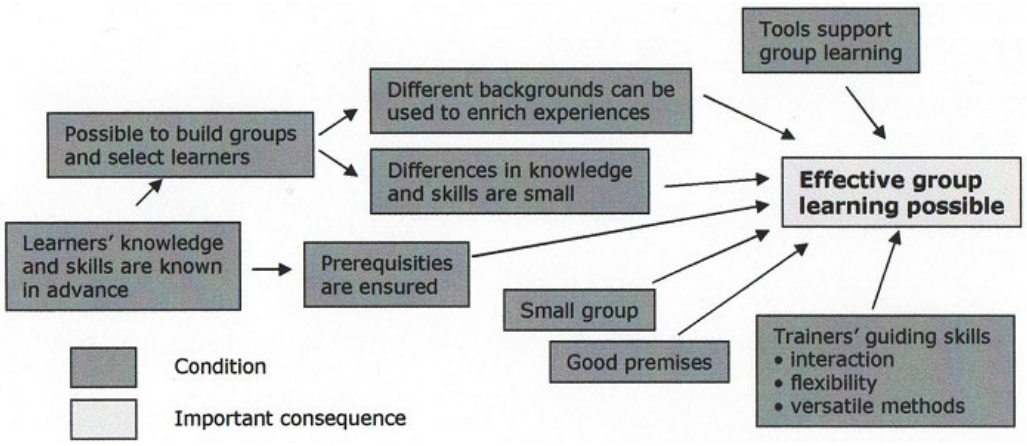

Figure 2 General facilitating factors for effective group learning

workshops there were big differences in learners' knowledge and skills, but the trainers could compensate this with flexibility and good atmosphere. This demanded a great deal of effort. An easier solution, and a solution for less experienced trainers, would be to select the learners better by finding out about their abilities in advance. The greater the differences in learners' knowledge and skills are, the more flexible and resourceful the trainers must be. The used tools supported group learning by structuring the work. The trainer could quickly see what the situation was and where the learners were proceeding in their cases. The most important conditions for effective group learning based on the research material are visualized in Figure 2.

Part 2: Guidance of case-based group learning

The central and one of the most important elements in the guidance of case-based group learning appears to be discussion in general, including discussions with trainers, with peers, and within the group. Experienced learners appeared to be as good learning guides as the trainers, and group discussions appeared to work without trainers under some preconditions presented later. Methods which most affected the progress of learning towards better expertise appeared to be first getting experiences through performing case-exercises (created enthusiasm and questions) and then discussing those experiences with peers, trainers, and the whole group (gave answers, new viewpoints, revealed strong and weak points). The trainers' role was both to give support in difficult questions and to create conditions for experiences, to create the atmosphere, to guide towards sources of information, and to take care of other similar kinds of facilitating factors.

A precondition for getting experiences from case-exercises is having some basic knowledge to understand the case. This also facilitates the understanding of the context, which is essential to be able to identify with the situation and understand the entity. The basic knowledge also facilitates learning at one's own

pace and using personal learning styles[16]. Learning basics would probably need more structured methods. Lack of sufficient basic knowledge came out in the second workshop where one learner had to be transferred to share a workstation with a peer.

One of the conditions for discussion was good atmosphere. In spite of the pressure, the trainers were especially skilful in this, behaving informally, being relaxed, joking, showing interest in every problem, allowing personal working methods, in addition to being flexible in general. Shared orientation appeared to work well as an "icebreaker". It helped in creating the context for learning and sharing it with others (each learner told about his/her background and goals for learning). At the same time it gave the trainer a possibility to show interest in each learner (he asked a complementary question from each learner), and in this way supported them publicly and contributed to the atmosphere of learning. The good atmosphere and trainers' personality also made questioning possible. Criticism against tools and methods was presented openly, and no one appeared to be offended by it.

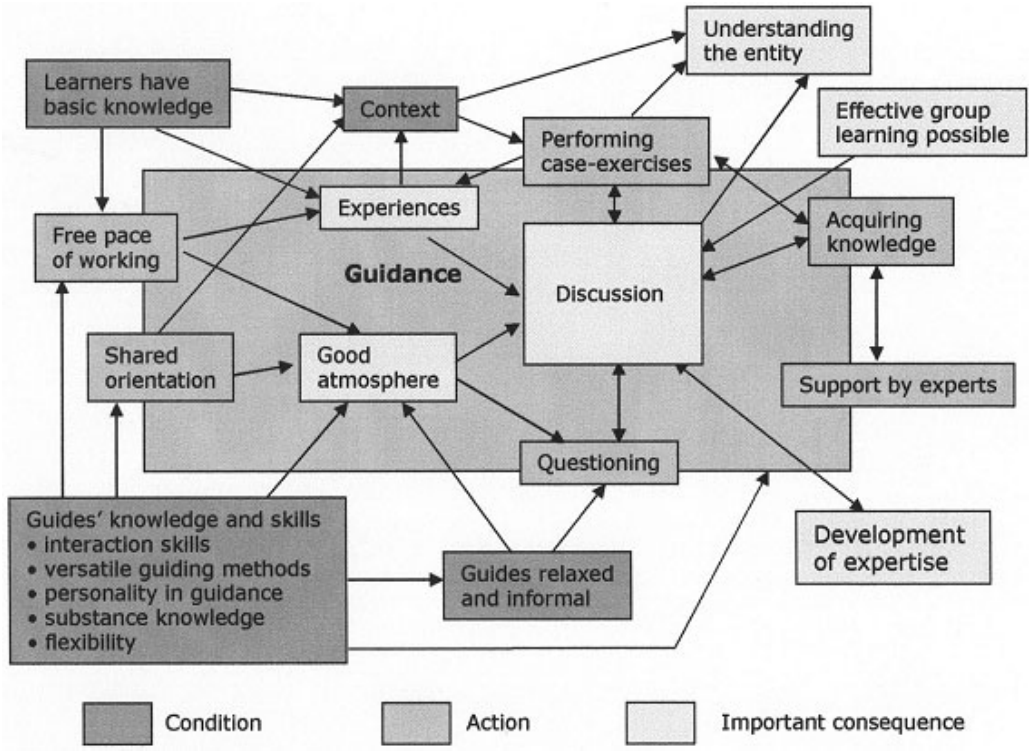

Figure 3 Guidance of case-based group learning

[16] Learning style is the general tendency to adopt a particular learning strategy. (Entwistle, 1983, p.93)

Good sources of information are essential for performing case exercises. The trainers had extensive knowledge, which was helpful but not sufficient. More and faster expert support would have been needed. The lack of good support material was also criticized. The most essential relations observed in the guidance of Case 1 are presented in Figure 3.

Part 3: Introduction of the developed expertise into normal work

Development of expertise is wasted if it is not used in normal work. Some necessary conditions for the introduction came out clearly. The technical facilities must exist, i.e. the infrastructure and tools needed for the utilization of the new expertise must be available. Possible needs for networking must be satisfied. ESC-operations are not possible without seamless teamwork between the ESC and sales organizations. The training of sales people was an unsolved problem, which may be one reason for Process B not becoming more common after the workshops. Continuous support was offered (participants were given the names of contact persons during the workshop); this was also wished by the interest group. Superiors were mentioned in the research material very seldom even if their role must be important. In one comment there were doubts whether all the superiors fully understood the idea of Process B and ESC. If this is true, it makes the introduction very difficult because the superiors affect the number and quality of further learning interventions, the feedback of operation, the facilities, and the way the subordinates see the entity.

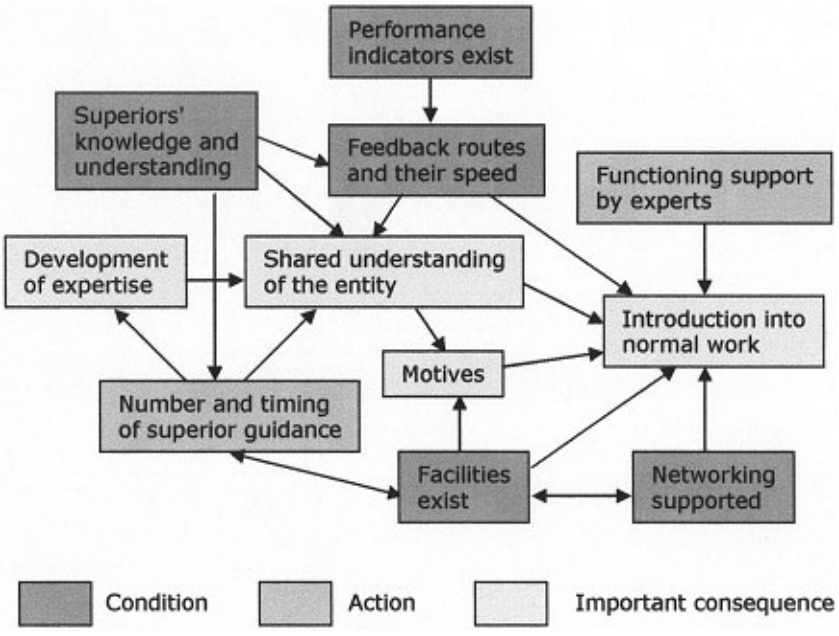

Figure 4 Introduction of the developed expertise into normal work

Understanding the benefits for the organization appeared to be enough to motivate the learners. Higher quality, faster delivery and response times, utilization of local expertise, leading to the possibility to make better profits created motivation for learning and using the knowledge and skills achieved. Some performance indicators were developed but they were not in general use in all the ESCs. There were also some plans how to make all the quality measurement results transparent to the ESC and sales together by using shared files in the local area network. The observed relations concerning the introduction of the developed expertise into normal work are presented in Figure 4.

Part 4: Mechanisms affecting the organizational level outcome

Engineering Support Center (ESC) was a new concept targeting at making the operations more effective by using a new way of action. The general targets appeared to be understood and accepted on the basis of the material. The centers were to be located everywhere in the world thus making the entity of the ESC community complicated and extremely difficult to manage because of the organizational and cultural diversity. Therefore heading the whole change project was very demanding and could not probably be done as a part-time job. However, the change project had no full-time project manager. This obviously led to the situation where some important but difficult decisions remained open (e.g. the principles how ESCs will be formed in different countries, who will be recruited, and what the others will do). This appeared to have led to the situation that there were no plans about the entity, or how the new way of action was to be introduced globally. That was supported by the fact that the new way of action was not imperative. Process B was not intended to replace the older processes A and C but to bring a new effective alternative in addition to the older ones. It was, therefore, possible to use only Process C, but this was, of course, done at the expense of competitiveness.

If the entity was not clearly planned and it was possible to continue as before, the local managers did not necessarily understand the benefits or considered them so small that it was not worth investing in Process B. This easily led to lack of facilities for Process B, and the entire goal was not achieved. However, in spite of the lack of difficult decisions, "easier" and evidently needed issues could progress (e.g. development of tools for Process B). This happened where the general targets and their benefits were understood (e.g. in the supporting units and progressive front-line units). This way active units were able to implement new processes and benefit from them. Thus, even if the entire goal was not achieved, partial goals were reached. The idea is briefly described in Figure 5.

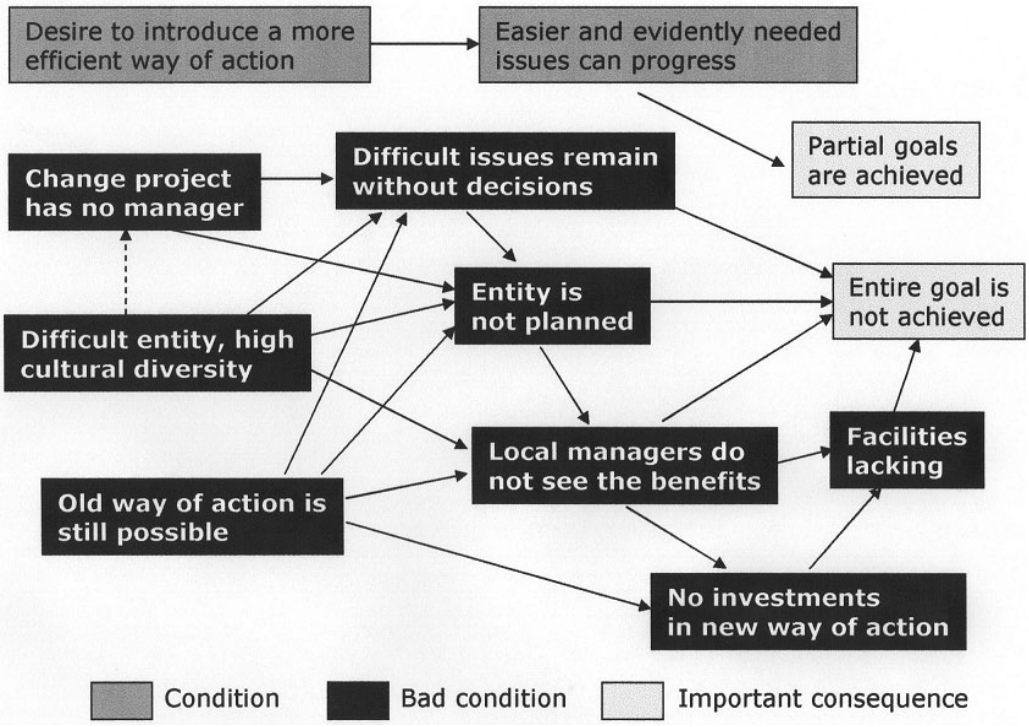

Figure 5 Mechanisms affecting the organizational level outcome

This ends the exploration of Case 1. In the next chapter Case 2 is explored, and after that in Chapter 4 the theoretical framework is further developed based on the results of the exploration phase. These results will be used to focus the literature review on the most essential issues making the development of the general model possible.

3.2 Case 2: In-house business school

This chapter describes the exploration phase of Case 2. It starts from a general view to the research data and continues with analysis of the material. A general description starts the analysis and then the main points of the observations, questionnaires, and interviews are described. After that the results of the open and axial coding of the research material are presented. Finally, the results of selective coding are given in forms of narratives and graphs. If the reader is not interested in the details of the case, it is possible to proceed directly to Chapter 3.2.2.5 and still understand the following chapters.

3.2.1 Data collection

The data collection for Case 2 (see Chapter 2.3) started 25 May 1999 when the sixth Internal Business School course (IBS 6) started (program in Appendix 4). After that date the guide of the strategic projects was observed and, in principle, all his interventions for the whole course and for the working groups were

Table 5 Data collected and used in the analysis of Case 2

Data collected	**Date**
Subjects of the strategic projects and working methods lecture, videotaped	May 25, 1999
Presentations of the preliminary working plans (strategy groups) six presentations commented by the guide, videotaped	May 26, 1999
Strategic projects kick-off (lectures, group work, presentations) lectures and presentations videotaped	August 18, 1999
Strategic clinics (½ day/group) guiding of workgroups, videotaped	September 6-9, 1999
Strategic clinics II (running parallel with Workshop 3 program) guiding of workgroups, videotaped	November 11, 1999
Strategic clinics III (running parallel with Workshop 4 program) guiding of workgroups, videotaped	December 10, 1999
Intermediate reporting (½ day/group) guiding of workgroups, videotaped	December 20-22, 1999
Evaluation of strategic projects presentations and discussions, videotaped	February 10, 2000
Questionnaire made in the closing seminar 28 answers	March 10, 2000
19 interviews of learners, guides, and management, recorded on MiniDiscs	March 3– April 3, 2000
The information stored in the Intranet based learning environment	May 24, 1999 – March 10, 2000

videotaped. However, situations where the guide just dropped in and said a few words with the group in a meeting room could not be recorded for practical reasons.

A total of 12 days were partly or fully videotaped comprising nearly 60 hours of material. The audio-recorded 19 interviews were appr. 25 hours altogether. After all the video material had been recorded, one group was chosen for a more detailed analysis. Everything where the guide and this group were present was transcripted, maintaining the key parts of the interaction (not their exact words). Thus the transcription of the video material is already more or less an interpretation of the observer (the researcher). The interviews were fully transcripted as far as it was possible to understand the words used. The results of the questionnaires were summed up into one document. The usage of the intranet-based learning environment was analyzed from the whole course period.

Two different triangulation methods can be seen to improve the validity of the data collection process:

- several data collection methods are used: observations (videotapes and the computer-based learning environment), interviews (audio-recording), and questionnaires
- data is collected from different sources (learners, learning guides, management)

The presuppositions and general framework which controlled the data collection process are presented in Chapter 1 to the extent possible.

3.2.2 Analysis

The documentation of the analysis is divided into four different parts: general description, observations, questionnaires, and interviews. Although these are separate parts in the documentation, they have had constant interaction with each other in the actual research situation. Therefore the documentation cannot exactly follow the actual process.

3.2.2.1 General description

As already mentioned in Chapter 2.3, the main objectives of the Internal Business School (IBS) were as follows (Karike, 2000):

- to make the most essential issues in the Company’s strategy more understandable
- to promote the Company’s change process
- to improve the facilities required for international co-operation and rapidly changing operations
- to improve in-house co-operation and networking
- to create willingness and spirit for continuous learning

IBS is intended for key experts who will play a major role in ensuring the Company's future. It is arranged twice a year and lasted at that time when the research was done slightly less than a year. The number of participants per course is appr. 30. IBS 6 had five workshops, each lasting 2-3 days, which formed the backbone for the program. They were complemented by four optional modules (1-3 days each) for the development of operational competences. Each participant had to be present in all the workshops and choose at least one optional module. In addition to these the participants had to carry out a demanding strategic teamwork-project, which took about 10 months. Also books had to be read, the summaries of which were presented in pairs.

The case is focused on the strategy assignments of IBS 6. This work was done in groups of 5-6 participants. The division into groups was made firstly according to participants' home units and secondly according to their learning styles. The idea was that each group should have persons from different parts of the organization and, at the same time, have a diversity of different learning styles.

The subjects of the strategic projects were real problems of the Company's management and directly linked to the strategy process of the Company. They were led by a known expert and supported by mentors, who usually were directors and experts from the Company. The process took about 10 months and was done alongside one's regular work. Some of the teams had members living far from each other.

The leader of the strategic projects met the teams separately several times during the course. Additionally, every team had a mentor of its own, who had expertise in the area they were working with. The mentor and the team could independently choose the type of co-operation they wanted to have. The culmination of the IBS was the last workshop, Evaluation, where the results of the strategic projects were presented to the top management of the Company. The topics were discussed and the teams got immediate expert feedback. The best teams were requested to give additional presentations for specific audiences.

A prototype Intranet-based learning environment was in use in the course but it was not yet integrated strongly into the process.

3.2.2.2 Analysis of observations

The way to make observations was different from Case 1. The guiding of the strategic projects leader was followed and everything related to the strategic projects with the workgroups or with the whole course was videotaped (excluding comments he gave when briefly observing work groups at work). Short notes were taken during the recording and complemented afterwards from video tapes. One group (Group 3) was then selected for a more detailed analysis. There were events where all the students were present and events where a group was guided alone. The events observed and their durations are presented in Table 6.

Table 6 The observed events of Group 3

Observed event	**Date**	**Time**	**Present**
Subjects of the strategic projects and working methods lecture, videotaped	May 25, 1999	0:58 (h:min)	all students
Presentations of the preliminary working plans (strategy groups) six presentations commented by the guide, videotaped	May 26, 1999	1:20	all students
Strategic projects kick-off (lectures, group work, presentations) lectures and presentations videotaped	August 18, 1999	5:11	all students
Strategic clinics (½ day/group) guiding of workgroups, videotaped	September 6-9, 1999	2:58	Group 3
Strategic clinics II (running parallel with Workshop 3 program) guiding of workgroups, videotaped	November 11, 1999	0:32	Group 3
Intermediate reporting (½ day/group) guiding of workgroups, videotaped	December 20-22, 1999	3:07	Group 3
Evaluation of strategic projects presentations and discussions, videotaped	February 10, 2000	1:22	all students
	total time	**15:28**	

The final notes made were analyzed with a computer program designed for qualitative analysis (Atlas.ti).

In addition to the events the utilization of the Intranet-based learning environment was observed during the whole period from 24 May 1999 until 10 March 2000.

The observations can be summarized as follows:

- the guiding can roughly be divided into six phases:
    1. giving information and tools (the tasks were real problems and therefore much information was given on the business environment and situation as well as on helpful tools). In this phase the targets of the work appeared to be indirectly set high by telling success stories from previous courses and how much they affected real decisions, positively challenging and provoking the group.
    2. letting the groups get to know each other and the subject (letting the groups develop a working method, think of their tasks, and form the first guidelines for the whole program)
    3. listening to the first thoughts and increasing the amount of information (asking and giving additional viewpoints, challenging the group, increasing anxiety and chaos)

4. supporting convergence (intermediate reporting appeared to be the final point were convergence and a clear idea of the presentation were expected).
5. supporting the formulation of the presentations for the executives.
6. supporting the presentations by chairing the Evaluation event actively and helping to keep the whole day (six presentations) interesting (clarifying important points, asking good questions, starting debate and discussion, valuing new ideas, giving examples from real life, asking for opinions, etc.).

- the guide (the strategic projects' leader) had an enormous amount of knowledge and experience in the target area. He told 54 real life examples, referred to 21 persons and 12 books or articles, and used 12 metaphors[17] in his speech (during his 15 hours of guiding with Group 3). However, it was not a monologue or lecture because the students had over 260 comments or questions and the guide appr. 240 comments or answers during the same time. The principal made 64, the facilitator 24, and the Group 3 mentor 22 comments (the mentor and the group had contacts also in other situations which were not observed).
- the guide mostly used (122 times) a comment type which can be called "guiding comment". Instead of giving a direct answer it somehow helped the student or group. For example: "You just asked a question related to the whole background as shown in this picture; are you focusing on this (showing one part of the picture) or are you considering both sides… (translated direct from Finnish, the original: "Nyt sä juuri kysyit koko tän taustakuvan kysymyksen, onks se niin, että keskitytte tähän (näyttää fläppiä) vai otatteko molemmat puolet…").
- there were 27 evaluative comments (22 positive and five negative) (e.g. "splendid summary", "good start", "these are good, I would not add anything" or "bad substance on this slide, too general, take a look at this once again…", "your presentation suffers from excess information…" (translations)).
- the guide had several positive suggestive comments, especially at the beginning ("this will become excellent work", "a hotter topic than yours does not exist").
- the guide thanked the students, mentors, or facilitator (17 times) for valuable comments.
- when all the students were present, a fairly small group (around 10 students) participated in the discussion. There were people who never said anything in these events but were more active in group work. The guide did not try to make everybody participate actively. People who liked to listen only were allowed to do it.
- the principal, who represented the views of the Company's management, was an active participant with his 64 comments.
- sometimes (seven observations) the guide helped the group by collecting ideas from the audience for a specific topic.

[17] "A metaphor is an imaginative way of describing something by referring to something else which has the qualities that you want to express." (Collins Cobuild English Dictionary, 1995)

- there was a great deal of humor in many comments (32 humorous comments observed), which appeared to have a stimulating effect especially in long sessions.

In the second workshop in Case 1 there were six points which were especially observed. Its worth examining these points also in Case 2 to understand the differences between the cases better:

1. trainer / learner contacts and how trainers differentiate learners according to their knowledge and skills

The guide clearly emphasized the substance and made it very clear and interesting by using many examples. He helped active people and established a good rapport with them. The silent ones were allowed to be silent and no attention was directed to them. No differentiation was observed.

2. flexibility of the trainers to change methods, program, experts, etc. to achieve the best possible learning results and the general ability to make things to run smoothly

Impressive flexibility came up in the guide's ability to take ideas from the audience and develop the theme towards common goals, adding several examples at the same time. The program was changed if needed, e.g. an additional guiding session was arranged for one group. The most dramatic changes in methods were seen in the groups which were unable to crystallize their thoughts enough before the intermediate reporting. These groups got detailed recommendations how to proceed. The guide appeared to want to ensure that the group knew at least one way to proceed to a good presentation. The worst barrier for the flexibility was the guide's time pressure. It was impossible for him to give guiding outside the scheduled events.

3. how clearly the trainers deal with issues, express goals, and support orientation

The main means to make things clear were the numerous examples and metaphors the guide used, in addition to drawings on the flip chart. The goals of the strategic projects were repeated several times. However, they were not expressed very specifically. The orientation was supported to a certain extent by asking students sometimes for experiences and developing the theme based on them. Thus only a few students got direct support in orientation. However, the others probably benefited from these experiences also.

4. discussion between the learners

Discussion in work groups between the learners was active even in the presence of the guide. In the events where all the students were present the discussion was sometimes active, but it was only between quite few persons.

5. how much the trainers get the learners to do different tasks (instead of lecturing or demonstrating)

The basic idea of guiding appeared to be to create chaos first and rely on the students ability to stand it and develop something new from it. It was mostly successful and the students got new ideas, which they developed by themselves.

In some cases it did not work and the guide had to give some detailed instructions how to proceed. Maybe the students would have needed more support to stand the pressure of not knowing exactly what to do and how to do it.

6. Assessment of learning

According to the observations, assessment of learning happened mostly in the intermediate reporting and slightly less in the evaluation workshop. There the guide, mentor, and principal had an opportunity to express views about the results. No tests were arranged.

Possible critical issues in this kind of training could be the following:

- having excellent experience and knowledge in the subject area is a basic condition for the guide.
- timing of the phases is challenging. The group should have chaos long enough to be able to crystallize new ideas, but not so long that they do not have time to make a good presentation.
- creating enthusiasm and helping to see the challenge and importance of the task is probably needed to have a highly motivated group
- not only creativity and innovativeness are needed in the strategic projects but also systematic hard work. The right balance between systematic and creative work appears to be important.
- the group appears to get a good start if the basic terminology and good tools are introduced at the beginning.
- the group has to do the task itself, not the mentor or guide.
- the guide and mentor can improve the creativity by bringing new and even contradictory viewpoints to the group, thus increasing chaos. At some point, however, the convergent part should be started. It may be critical for success to know exactly when not to increase the chaos more, but to start support for convergent work.
- one of the crucial things for success in the longer run is that the executives, who are the main audience when the works are presented, get new ideas and find the presentations useful. Helping the group to decide the main points to be stressed in the presentation and helping to avoid dullness by being aware of how the executives think and what is valuable for them, may be critical.
- without the ability to get learners (at least some of them) to express their thoughts in public and discuss them, the guide cannot get enough feedback to take up the right issues.
- guiding comments (questioning, thinking aloud, presenting other viewpoints, using metaphors, giving examples) are probably the most efficient way of guiding capable, self-directive groups. Detailed instructions appear to be needed only if the group cannot decide on something or is totally lost.
- it is difficult to evaluate the value of positive suggestions and encouragement but they may be crucial for success.
- there should be someone from the management present as much as possible (like the principal in this case) to give the right information, e.g. on the reasons behind some decisions. However, this person should not guide the work too much. The group has to be allowed to bring in new ideas.

- humor is a powerful tool. It is hard to believe that any guidance would succeed if it was totally missing. If the guide does not want to use humor, he should allow it for the groups.
- user-friendliness and real added value for the learners appear to be the most crucial issues in learning tools like the intranet-based learning environment. If the learners understand the benefits and find using the tools the easiest way to progress, they will use them, otherwise not.

3.2.2.3 Analysis of the questionnaire

A questionnaire was given to the learners at the closing seminar on 10 March 2000. At that time seven (including the whole of group 3) of the 19 interviews were already carried out but not analyzed. Interesting ideas had come up and the opportunity to reach all the learners easily right after the last workshop was utilized for testing the preliminary ideas. In addition to the questionnaire made by the researcher, there was a questionnaire after each workshop to get feedback. Those questionnaires were not analyzed because they contained very little information on the strategic projects. However, it is worth mentioning, that the mean value of the workshop evaluations was better than four on a scale of 1-5, where five is the best possible value. Also, whenever the leader of the strategic projects (the guide) was on stage at the workshops, he got excellent evaluations. The whole learning program and the guide were thus found good by the learners.

The questionnaire was in Finnish and the actual form is presented in Appendix 5.1. The translated summary of the results is presented in Appendix 5.2.

The results show that most of the participants were satisfied with the issues asked. However, some points are worth noticing:

- 36% of the participants would have liked to have more coaching of teamwork
- 32% of the participants would have liked to have more coaching for the final presentation
- 43% of the participants found the time period reserved for the strategic project too long
- there was only one negative comment about guidance
- 96% of the participants had in some way disseminated the ideas got at IBS and 43% had made at least one presentation about IBS subjects in their own unit
- almost all were interested in the possibility to study cases independently, however, only 11% were sure that they would utilize the opportunity
- 43% of the participants would have liked to have feedback about their way of working in a team
- 43% of the participants would have liked to have more guiding sessions
- the average value of wanted guiding sessions during the course period was four
- 68% of the participants would have liked more discussions with their superiors about their future, and about how to utilize the learning results achieved at IBS

- almost everybody (89%) felt that they were allowed to work as a group independently enough
- the average best time for the intermediate reporting is when 59% of the strategic project time has elapsed
- the literature summaries should be earlier so that it would be possible to utilize them better in the strategic projects (one comment)
- the five properties of the learning environment that were considered most important were
  - store for all the material related to the course
  - version management of the strategic project
  - common document archives for the group
  - bulletin board for the whole course
  - planning calendar for the group where all the deadlines agreed etc. can be seen

According to the questionnaire possible critical issues could be the following:
- the superiors of the participants are interested in the IBS, know the content well enough, and can utilize the learning results achieved
- coaching of team work is available at least as much as in this course (the facilitator observed the teams and had some small interventions related to the subject)
- there is coaching of the final presentation at least as much as in this course (the guide and the facilitator gave the main points)
- sufficient feedback for the learners
- the computer-based learning environment (if used) is easy to operate and fast

3.2.2.4 Analysis of interviews

The 19 interviews were all carried out after the evaluation workshop. The interviewed persons included all the participants of group 3, one person from each of the other groups, the guide, principal, facilitator, two directors, HRD director, and two mentors. The discussions were recorded on MiniDiscs, transcripted afterwards, and analyzed with a computer program designed for qualitative analysis (Atlas.ti). The method used in the interviews was semi-structured following a basic structure, but giving space, and sometimes forgetting the structure, when the interviewee became enthusiastic about the topic, and elaborated something in depth. The structure consisted of the following main subjects:
- success of the strategic project
- learning results and their applicability
- guiding (mainly how the guide, mentor, and facilitator succeeded)
- learning methods used
- teamwork
- superior's involvement
- tools to help learning

Some typical questions asked from the students are listed in Appendix 6.

Open and axial coding (see Chapter 2.2) were done for the interview material. First a quotation from the material was marked and named, and then it was placed under an applicable category heading. However, when the coding proceeded the names of categories had to be changed many times to refine the created hierarchy. The transcripted material (appr. 200 pages) gave more than 400 codes and they could be divided into seven main categories:

1. goals of the whole program and goals of the strategic projects
2. guiding
3. learning community
4. learner's work community
5. utilization of results
6. tools
7. improvements (how continuous improvement is built into the entity)

There are three new categories compared to Case 1: goals, utilization of results, and improvement (actually the category "goals" were also in Case 1 but it was included in the category "learner and work community").

In the following the most relevant parts of the code hierarchy are presented with some quotations. The total number of quotations was 1100 and therefore only a few of the most interesting issues related to the research questions (see Chapter 2.1) are focused on.

The whole learning program and goals

Learning method

An important feature of Internal Business School is its business linkage. The strategic projects are real business cases with no evident answers.
"Rakenteena IBS on uniikki, sillä se on ensimmäinen, johon saatiin bisneslinkitys. Se ei ole "vaan" oppimista, koulutusta tai kurssia, vaan tämän firman strategian ja tulevaisuuden tekemistä." (translation: "As a structure the IBS is unique because it is the first one with business linkage. It is not "only" learning, training, or a course, but making the strategy and future of this company.")

Versatility of the learning method was mentioned many times in the interviews. The method contains both structured elements (e.g. workshops, additional modules) and self-managed team learning (strategic projects). One mentor states:
"… tämä on ollakseen koulutusta niin hyvin lähellä on-the-job -trainingia. Mutta toisaalta siinä on myös näitä koulutuksellisia elementtejä, se on strukturoidumpaa ja määrätietoisempaa …" (translation: "… even though this is training this is very close to on-the-job training. But on the other hand it also has instructional elements, it is more structured and more goal-directed (than pure on-the-job training).")

Strategic projects

One person, who was in the group which prepared suitable subjects for the strategic projects, was asked about the secret of good subjects. He answered as follows:
"… me oltiin itse tässä työssä, missä me tuettiin johtoa ja tiedettiin, mitkä ne huolet siellä on ja me osattiin tulkita sitä kautta sitä tahtotilaa, että millainen teema on tärkeä." (translation: "… we ourselves worked with the same subjects supporting the management, and we knew their concerns and that way were able to understand their wishes for important themes.")

However, substance is not the only important issue, although the audience in the Evaluation workshop appears to put the highest value on it. Learning methods, team working skills, and networking with people from different parts of the organization are of utmost importance as well. That is also the part which can be used for a much longer time than the substance, which might lose its actuality very soon. A manager states:
"… strategiatöiden tarkoituksena on aikaansaada tää… voisko sanoa… niille ihmisille yhteinen menetelmäpuoli, mitenkä joitakin asioita, tämmösiä studeja, viedään eteenpäin. Ja toinen puoli vaan, ja ei välttämättä se painavin puoli, on tämä itse substanssi siellä sisällä. (translation: … the idea of the strategic projects is to achieve… one could say… common methods for the participants how these kinds of studies can be advanced. And the other side, and not necessary the more important side, is the substance inside there.)

Guidance

In the interviews the majority of the participants were asked what they found best in the guide. As an example, the answers of one participant and one mentor:
"- Näkökulmat, ehdottomasti. … … Musta ohjaaja on ollut juuri coachi tällainen valmentaja ja se voi sparrata ryhmää erilaiseksi, mutta ryhmä tekee sitten nämä päätökset kuitenkin. Se ei ollut joukkueen johtaja vaan tämmönen ulkopuolinen valmentaja." (translation: "-Viewpoints, definitely. … … To my mind the guide has been a coach and he can challenge the group to become different but the group of course makes the decisions.")
"… hän kantaa huolta tästä tuoreudesta ja sen suhteen voisi olla vieläkin tiukempi ehkä." (translation: "… he takes care of the freshness and this could maybe be focused even more.")

There is no doubt that the guide succeeded in his task. In the interview he told how he had prepared for the guidance:
"… kyllähän mä tähän valmistelen enemmän kuin ryhmät ikinä arvaakaan, mä valmistelen niitä etukäteen. Mähän tavallaan itse pyrin tekemään sen työn aina ennen jokaista ryhmää. Mä itse pyrin ne ensin ratkaisemaan. Mutta sitte sen jälkeen koetan ehkäistä sen, etten mä omaa ratkaisuani tuo siihen." (translation: "… I prepare for this more than the groups can ever guess, I

prepare them (the strategic projects) beforehand. I always try to do the project before each group. I try to solve them myself first. But after that I make an effort not to bring my solution to it.")

Sometimes the group must be helped even in understanding the basics in the subject area. The guide takes care of this by giving structure, framework, and instructions, instead of letting the group suffer too much. After getting their self-confidence back the group can again continue in a more self-managed way. The guide describes it as follows:
"Kyllähän toisille mä annan ihan niin sovinnaisia perusehdotuksia, että käsitelkää se näin. Enkä mä silti ollenkaan ajattele, että ne siihen jäisivät vaan mä tietysti toivon, että ne vaan pääsee sen prosessivaiheen yli, tulee itseluottamusta siihen, että saa otteen siitä." (translation: "For some groups I just give conventional basic schemes how to handle it. And I never think that they will limit themselves to this; I hope that they can overcome that phase of the process, get self-confidence and grasp it."

It is challenging to have the right level of ambition. One student states:
"Jossain vaiheessa tuli sellainenkin olo, kun hän sitä rimaa pyrki pitämään korkealla ja nostamaan niin suhteessa siihen, että hänenkin olisi hyvä tietää, mitkä on ne realiteetit, paljonko ihmiset voi käyttää aikaa tuollaiseen. Siinä tuli mieleen, että hän on konsulttina ja hänelle on tärkeää, että nämä on hyviä mutta vähän sillain karrikoidusti ajateltuna, että kenen intressi tässä itseasiassa nyt on. Hänen pitäisi tietää myös ne realiteetit, että kun tätä oman työn ohella tehdään, niin kuinka paljon tätä voi tehdä." (translation: "At some phase, when he (the guide) tried to keep the standard high and raise it, I felt that he should know the reality, how much time it is possible for the participants to use for something like this. It occurred to me that for him as a consultant it is important that the result is good but whose interest is actually in question. He should also be aware of the reality that as we were doing the project at the same time as our own work, how much it is possible to work with it."

One group appeared to have no problems with the high target:
"… jos ei homma miellytä niin ei tarvi noudattaa hänen jokaista ohjettaan kirjaimellisesti ja ei me varmaan niin tehtykään. Me kuunneltiin kaikki ja sitten tehdään niin kuin meinataan." (translation: "… if we don't like something, there is no need to follow all his instructions literally, and I don't think we did it either. We listened to everything and then we did what we liked.")

One of the mentor's tasks is to show the existing knowledge in the substance area in the organization. One participant expresses his wishes in the interview:
"Tavallaan, että kummi opastaisi sinne viidakon reunalle ja näyttäisi missä on se yleisesti tunnettu body of knowledge, ja sitten tämän ulkopuolella on sellaista mielenkiintoista aluetta, eli että opastastaisi sinne reunalle." (P2) (translation: "The mentor should in a way guide us to the border of the jungle and show where the generally known body of knowledge exists, outside of which the most interesting area can be found.")

The facilitator is the key-person taking care of the whole program. Integrating the separate workshops together is one of his important tasks. The course director explains this task as follows:
"Fasilitaattori on katsonut paikan päällä, että se mitä mä olen speksannu, myös tapahtuu paikan päällä, jotta niistä irrallisista workshopeista muodostuu tavallaan se yksi kokonaisuus. Hänen tehtävänä on tuoda edellisessä workshopissa esille nousseet teemat seuraavaan workshoppiin." (translation: "The facilitator has checked on the spot that what I have specified also happens on the spot, and the separate workshops, in a way, form a single entity. His task is to bring the themes that have arisen in the previous workshop to the next workshop.")

The facilitator has many possibilities to affect the spirit or atmosphere in the course. He described that side of his work in the interview as follows:
"… koetan vaikuttaa siihen, että se tehtävä koetaan mielenkiintoiseksi. Ja toinen, johon yritän vaikuttaa on se, että se olisi rento se ilmapiiri. … ja jos mä löydän huumoria, mä käytän heti, mieluiten sellaista, joka liittyy suoraan siihen tilanteeseen niin että saadaan naurut aikaan." (translation: "… I try to make the task appear interesting. And another thing I try to contribute is that the atmosphere would be relaxed. … and if I find humor I use it at once, and most preferably that kind of humor which is directly connected to the situation so that we get good laughs.")

The principal is a representative of the top management of the company. One participant expressed his role very well:
"Rehtorinhan tietysti pitäisi nivoa tämä merkitys tähän yhtiöön ja kokonaisuuteen ja pitää niitä ylälinjoja kasassa ja miksi siellä ollaan ja mitä siellä tavoitellaan." (translation: "The principal should of course integrate the meaning to the Company and to the whole program and keep the main lines together, why participants are there and what the goal is.")

Interventions

As a learning method, coaching got support both when the guide gave it, and when it was done in the workshops:
"Tämä oli mulle yksi asia, jonka mä opin kurssilla, että mä opin yhä enemmän uskomaan tämmöseen coachingiin." (translation: "The one thing I learned in the course was that I learned more and more to believe in this kind of coaching.")

The facilitator, who has experience from many groups during many courses, confirms that there usually is a chaos-phase in the strategic projects:
"Muistaakseni kaikissa oli kyllä jotenkin se sellainen jälkikäteisarvio, että jossakin vaiheessa on pohjakosketus ja sellainen tilanne jossa kaikki tuntui leviävän käsiin, että parhaat ryhmät kävivät jopa aika syvällä ja sitten kun se lähtee nousuun niin se on hieno vaihe." (translation: "If I remember right every project was afterwards evaluated as having in some phase met the bottom and experienced a situation where nothing can be achieved, and the best groups

even went quite deep, and then, when the process starts to come up, it is a great phase.")

Feedback

The groups sometimes felt lack of feedback on their strategic projects:
"… yksi oikeastaan mitä ei oikeastaan ollenkaan ole saanut sitte niin on sellainen ihan oikea palaute siitä työstä. Jos ajattelee mitä me ollaan saatu niin erityisesti mehän saatiin ehkä 15 sekuntia kun ohjaaja arvioi sitä parilla kolmella lauseella. … kyllä mä kaipaisin, että joku ihan oikeasti käyttäisi hetken aikaa sen työn arviointiin ja kirjallisesti tai ryhmälle suullisesti antaisi palautteen." (translation: "… one thing which we actually never got was a real feedback on that work. If one thinks what we have got, so especially we got about 15 seconds when the guide evaluated it with a couple of sentences… I really would have wanted someone to use time for evaluation either in writing or giving oral feedback to the group.")

The consistency of feedback is important. Sometimes it was felt that the critique from the guide in the Evaluation workshop was not fair because he, in their opinion, gave better feedback in the intermediate reporting:
"Mutta jotenkin hänen sanavalintansa siinä evaluaatiotilaisuudessa oli sellaisia, että me oltiin kaikki että aijaa, eikö tämä nyt ollutkaan mikään hyvä. Mutta ehkä sitä on niin yliherkkä." (translation: "But somehow his (guide's) words in that Evaluation workshop made us all wonder whether it was good after all; but maybe one can be so oversensitive.")

Learning community

In collaborative learning every learner should have courage to ask questions and bring in thoughts about the subject. However, it is not always very easy:
"Mutta kyllä mä ainakin yritin tuoda esille sekä omia näkemyksiäni että esittää niitä tyhmiä kysymyksiä senkin uhalla, että pidetään tyhmänä." (translation: "But I at least tried to bring out my own views and present stupid questions even though there was the danger of being regarded as stupid.")

It is important that the participants understand from the beginning, how their work is connected to the corporate strategy process.
"… et sen vois niinku tavallaan systematisoida, ja jopa kertoa, et näin nää liittyy isompaan kokonaisuuteen, mikä on myös sen motivoinnin kannalta parempi. Nyt meil oli sellasii ajatuksii vaan siitä että näitä mahdollisesti käytetään hyödyksi …" (translation: "… so that this could be systemized and even said, that in this way these (projects) are connected to the bigger entity, which is also a more motivating way. Now we have only thoughts that these (projects) will possibly be utilized …")

Differences were understood and mostly accepted, but only partly utilized. It was difficult to adopt a good working method and to decide how to divide the work.

"Me käytettiin ihan hirveästi aikaa ja voi olla että me päivä käytettiin aikaa siihen kun me oltiin kaikki viisi läsnä eikä saatu mitään konkreettista aikaiseksi. … kukaan ei selkeästi ollut johtaja eikä muodostunut sellaista auktoriteettia." (translation: "We used awfully much time and it sometimes happened that we used a whole day all five together and couldn't achieve any concrete results. … no one was clearly a leader and no authority was formed.")

In a few interviews trust was mentioned as a basic need in a functioning learning community. Trust was said to create safety and to make open discussion easier.
"… hakisi siihen alkuun ensin tiimittymisen ryhmädynamiikkaa, että ne ihmiset luottaisivat toisiinsa ja kokisi, että tässä voi avautua." (translation: "… to begin with, the group dynamics of team building should be looked for so that people would trust each other and feel that it's possible to be open.")

Discussions between participants were one of the benefits mentioned most.
"Mulle [kurssin] paras anti on ollut juuri tämä verkottuminen ja kuuntelu ihmisten kanssa. Ja nämä vapaa-ajan keskustelut, lounaskeskustelut, mitä me ollaan käyty mitä ihmeellisimmistä asioista, niihin olisi pitänyt löytyä vielä vähän enemmän aikaa." (translation: "For me the best thing I got [from the course] has been just this networking and listening with people. And these free time conversations, lunch conversations which we have had about the strangest issues, for these we should have found still a bit more time.")

Learner's work community

One of the biggest and most frequently mentioned problems was time pressure. In addition to five three-day workshops and at least one optional module, the strategic project required several working days, evenings, and even nights. When the HRD manager responsible for the course was asked about the most criticized matters, she answered as follows:
"Ajan puutetta, että oma päivittäinen työ ja esimies, ei tahdo saada luvallista aikaa osallistua tähän. Vaikka valintaprosessissa on käyty läpi paljonko aikaa menee ja esimies on sitoutettu, … Tää menee vaan niin hektisesti eteenpäin, että he kokee sen stressaavana. He haluaa tähänkin panostaa ja vähän kolkuttaa omatunto, että mulla on työtehtävätkin tuolla, ja työajan lisäksi menee myös vapaa-aikaa. On selvitetty, ettei se kuitenkaan ole niin iso juttu, että se olisi kaatamassa tätä, mutta palautetta kuitenkin tulee jatkuvasti." (translation: "Lack of time because of one's own daily work and one's superior, it is difficult to get time allowed specifically for participation in this. Even if it has been clarified in the selection process how much time is needed and the superior is committed, … But this pace is so hectic that they find it stressful. They want to put effort into this too, and their conscience says that I have my duties there and in addition to working time also free time is needed. It has been studied, however, that it is not so big a thing that it would destroy this but we get feedback continuously.)

In the analysis of interviews there were over 30 comments concerning time pressure. Several possibilities were presented to help the situation, e.g. support

for effective working methods, support in time management, equipment for distant participation etc. It appears essential that both the participant and his/her superior are well informed about the amount of time needed when thinking about enrolment. If they have discussed the goals, and have a common understanding, the time pressure still exists but is easier to control.

Utilization of results

A representative of management commented on the presentations:
"pikkasen jäi kaipaamaan sitä, että ne olisi kirkastaneet sen sanomansa ja varsinkin sen osuuden, että mitä tässä on yhtiölle." (translation: "I missed a clarification of the message, and especially the part what this meant for the Company.")

And one of the top managers said the same:
"…liittyy oikeastaan tuohon key findings -asiaan, että sehän niistä puuttuu, että niissä substanssipuolen kovaa joidenkin johtopäätösten kristallisointia ei ole." (translation: "… it actually links to the key findings issue, that it is missing, that they do not contain crystallization of the substance.")

When asked about the personal achievements, networking and ability to see the entity were the ones mentioned most. One participant stated:
"se mikä mulle on jäänyt päällimmäisenä mieleen, se mikä on omassa ajattelussa muuttunut on ehkä sellainen, että nyt tosiaan katsoo laajemmassa perspektiivissä koko firmaa ja nimenomaan vielä mahdollisuuksien mukaan johdon ja omistajan näkökulmasta." (translation: "what I remember best, what has changed my own thinking, is maybe that now I look at the company with a much larger perspective and especially, if possible, from the management's and owners' point of view.")

After axial coding (see Chapter 2.2 about the method) of the interview material some categories were added based on the observations and questionnaires to form a complete hierarchy of Case 2. Table 7 shows what the top of the code hierarchy looked like after the completion.

Table 7 Categories gained by axial coding of Case 2 material

1. The whole learning program and goals
Learning method
Properties of the strategic projects
Setting the goals
Before the course
During the course
2. Guidance
Roles in guiding
Guide
Mentor
Facilitator
Other roles
Interventions
Eye-opening
Cases
Facilitation
Emotions
Instruction
Evaluation
Applications
After-course activities
Feedback
3. Learning community
Learner
Knowledge and skills
Motivation and initiative
Home location
Properties of the community
Different types of persons
Abilities
Discussion
Needs
Knowledge and skills
Atmosphere
Attitudes
Working methods
Influences of working methods
Methods for strategic projects
Support for teamwork
Idea creation
4. Learner's work community
Support of organization
Workshops
Openness of information
Mentor network
Knowledge framework
Commitment of superiors and management
Valuation of learning
Superiors' knowledge and skills
Superiors' attitude

Discussions with superior
Utilization of learning
Presentations
Informal discussions
Disturbances
Time pressure
Organizational stability
Pressure of demands
Thresholds
Decision making process in enrolment
5. Utilization of results
Achievements
Personal knowledge and skills
Contribution to business
Ways of utilization
Presentations of results
Documentation of the results
Acting as change agents
Competence management
Using the community
Making utilization easier
Starting phase
Follow-up
Combination of resources
6. Tools
Mental tools
Theories
Meetings
Affecting the attitude
Physical tools
Use of Int(er/ra)net-based Learning Environment
Used tools
New ideas
Maturity of the enterprise
7. Improvement (how continuous improvement is built into the entity)
Useful information
Groups' working
Evaluation
Prior arrangements
Feedback given
Superiors
Learning efficiency
Sources of information
Ways to collect information
Implementation of improvement

Table 7 was the basis for the selective coding, i.e. integration of categories to formulate theories grounded on the empirical data. The following short summary of the categories most related to guidance is based on the content of subcategories. After it the selective coding and summary of Case 2 is presented in item 3.2.2.6.

3.2.2.5 Summary of the most relevant categories

The whole learning program and goals

Internal Business School (IBS) searches for talented people to help them contribute better to the Company's future. It has elements of both structured learning (workshops) and self-managed team learning (strategic projects). IBS is, learning by doing. It is discussion with management and the creation of the Company's strategy and future. It is based on acute problems, and it requires networking and teamwork. The idea is to form groups consisting of very different people from different parts of the organization, and give them freedom to adapt the most suitable working style, and support it when needed. The groups are encouraged to question ordinary thinking and their innovativeness is supported. The students learn by sharing views with the management and high level experts. At the same time they assist in developing strategies.

The strategic projects are pragmatic and linked to real business life. At their best they produce knowledge, proposals, and contact area for actions in practice. The work is more creative than normal organizational work. The best reward the group can get appears to be the utilization of their results in the organization.

The subjects of the strategic projects are difficult for at least two reasons: if they were easy, the management would have solved them already, and secondly, the group needs challenges to be able to find the best possible methods for solving the problems and to be able to develop as a team. Sometimes the subject area is unfamiliar to everybody in the group. The real challenge is then to firstly understand the context and problems, and then produce something different from the mainstream thinking. Furthermore, it is difficult to find something new from a subject which has been already discussed in public for a long time.

Telecommunications is a very turbulent branch. Even an interesting subject can become insignificant in one night, and it is useless to continue the project after that. On the other hand, interesting subjects will be developed in the normal organization also, and it may be frustrating to the project to notice someone else has already utilized the results which the group has just found. Therefore it is important to carry out the strategic project fast and have all the possible support from the organization available. The best subject is not necessarily the hottest one. It is something new which is expected to remain significant even after a longer period of time. Those who define the subjects should be strongly involved in the company strategy process. The subject should also be defined loosely enough, so that the group can refine it in the direction its members wish.

The management's interest is important because of the utilization of the results and because of the motivation of the group. At the end the key points of the results should be presented in a very reduced form to be quickly understood by the executives. One way to improve feedback is that the key points are selected by someone outside the group. The management appears to appreciate the following qualities most - freshness, applicability, and questioning of ordinary

thinking. However, the learned methods, e.g. learning to learn, team working skills, and networking, are at least as important as the substance or content. The methods can be applied again and again whereas the content becomes obsolete very soon.

Guidance

The central roles in guidance were *guide* (leader of the strategic projects), *mentor* (expert supporting the group), *principal* (representative of the management), *superior*, and *facilitator* (supporting learning and the course in general). Human Resource Developers naturally had a role also, but they mainly operated in the background and were not involved in any direct guidance.

The guide was an experienced outsider, expert in business management, and his main roles appeared to be those of challenger, motivator, idea generator, and supporter in everything that was related to the substance. He clearly saw to the freshness of the result. The guide had excellent knowledge of the substance area, and he said in the interview that he always first did the strategic projects himself before starting the guiding. He coached the groups in helping to define the goals and to find the essential issues, he gave working methods, clarified concepts, supported in decisions, encouraged, and kept the projects to the right size and right level. The challenge for him was not to do the work for the group. The guide was also a strong instructor if needed (e.g. when the group did not show sufficient progress in the intermediate reporting). Then he gave a structure and framework for the project. At the end of the process the guide led the presentations of the results by summing up and clarifying essential points.

The mentors were insider experts in different areas bringing the Company's point of view. In addition to their expert role they appeared to be "knowledge managers" giving information about the existing knowledge base of the Company and giving their expert network for use. Often they also appeared to be coaches, idea generators, and supporters, as was the case with the guide. Occasionally they had to solve problems which the group could not agree on, in this way being facilitators of teamwork or even strong instructors at times.

The principal was an experienced senior executive, an active representative of management, participating in intermediate reportings and often in workshops. He knew the Company very well and was able to forward good ideas presented by the students to right places in the organization. The participants wished that he had had more informal discussions with them.

The facilitator, an outside consultant, was some kind of father character being responsible for the whole learning program. He saw to it that the workshops, additional modules, and other activities with their many expert visitors formed a meaningful entity. He was also the main supporter in teamwork and human interaction, and actively followed how the teams worked. He appeared to know everybody, had many informal conversations with them, and helped the silent ones to get their opinions heard. An important task was to give hints for self-

evaluation and reflection in teamwork. He also encouraged, gave feedback, and created the atmosphere by using a great deal of humor.

The first interventions in the course typically belonged to the categories eye-opening, facilitation, and instructions. Different viewpoints were presented, methods were shown, and instructions about operations, new concepts etc. were given. Support for teamwork was not sufficient even if the facilitator was active in this. The emotional side was influenced by creating chaos and challenging the group. In some cases the horror-effect appeared to be too strong, especially when both the substance and team working caused problems. Sometimes there would have been need for differentiation because of the different background knowledge of the subject area. The reward used most often was the phrase "thank you", and at the end also roses made of hammered iron were given to the best contributors. Energizing people, defining shared values for the course, and changing the environment were also interventions affecting the emotional state of the participants.

The main idea was to support innovativeness and let the groups perform the work without giving any exact guidelines. In later phases, however, some groups were given strong instructions when the guide felt that the group was confused or had not progressed enough. Post-course activities and utilization of the community later was not observed or mentioned in the interviews. Humor, positive comments, evaluation, and feedback can be categorized into interventions also.

Feedback in different forms was given throughout the course. Probably the most efficient way to get it was discussions between the group and the whole course. The guide supported discussions very well by giving examples and metaphors, in this way introducing possibilities for new ideas. The feedback from discussions appeared to satisfy most needs during the course. However, after finishing the strategic project many groups would have liked to have more feedback on their work. In some cases the short, under one-minute, feedback given in the Evaluation workshop remained the only final feedback on the several hundred hours of work. Two interviewees proposed that a separate group should pick the key findings from each of the strategic projects, making the utilization easier for the management and thus providing feedback to the work groups as well. It would have been correct to inform the group how the work was to be utilized and which unit, if any, was responsible for it.

The criteria for evaluation appeared to be quite unclear to the participants and the evaluation was considered inconsistent sometimes. In three cases it was felt that the evaluation in the intermediate reporting differed too much from the evaluation in the final workshop. One group got positive feedback in the intermediate reporting, felt that they were ready, and stopped working with the project. They were very astonished when they got some critique in the evaluation workshop. Sometimes also the priorities were unclear: was it more important to get an interesting result (from the management’s point of view) or to learn about the subject area and to adapt good methods for strategic projects

and teamwork. More feedback on the team building and teamwork would have been needed.

Learning community

The groups often had difficulties at the beginning. Having different personalities from different parts of the organization and only little advice on how to build a team, caused long discussions and delayed the start of the real work. Usually differences were finally understood and a common language found. A good sign of development was humor. However, the process took time and a level where differences were not only understood but also utilized, was seldom achieved. Therefore teamwork would have needed much more support if the substance was to be focused on, and not only the processes. An interesting question is, when is it better to dissolve a team instead of trying to support it.

Learning to know each other at the beginning appears to be important. It creates trust and a feeling of safety. After that it would probably be useful to have support in dialogical skills, in decision making skills, in giving constructive feedback, and in reflective skills.

Informal discussions, networking, and listening to others were often mentioned as useful. It appeared to be important to meet face-to-face. Time pressure was one of the problems mentioned most.

Learner’s work community

A great deal of time is needed for the course, and the support of the superior is therefore imperative. A shared understanding of goals should be achieved between the participant and his/her superior. It would also help the utilization of the learning results later. Without the superior’s positive attitude and support the course is easily a waste of time. Performance appraisals where future plans are considered would be an ideal situation to set the shared goals. It was interesting to notice that 68% of the participants who answered the questionnaires would have liked more discussions with their superior about their future and utilization of the learning results. A good sign of cooperation was that some superiors were active in arranging situations where knowledge could be shared between the participant and other members of the work community. Important issues related to the work community are also openness of information, superiors' knowledge and skills, and time pressure.

Utilization of results

Concentrating only on the essential issues and clearly extracting the key findings is crucial for the message in the final presentation. The significance of the last workshop was evidently too great because, if the presentation did not arouse interest there, there were only minor possibilities that the results would be

utilized later. It should also be remembered that the substance is not the only result. Good teams, networks, and methods can be reused after the IBS. It is as well worth noticing that different "soft" skills of the participants could easily be mapped during the IBS and stored to a competence management system. This way the forming of well-knit teams would be easier afterwards.

3.2.2.6 Selective coding and summary of Case 2

As in Case 1, the selective coding started by choosing "Guidance" as a central category. The arguments for that are presented in Chapter 3.1.2.6 and they also apply here.

The integration of categories was mainly made by reviewing the material and drawing diagrams. Different kinds of summaries were made to find the most essential issues and how they were related to the central category. Several small theories about the causal relations were produced and described in diagrams. These pieces were then combined. This way it was possible to see how the entity was formed. Different colors were used to indicate conditions, actions, and consequences.

The first research question (what the case was) and the second (how the guidance of learning was implemented in the cases) was answered in depth already during the axial coding. The third question (which guidance elements most affected how successful the different parties found the case), however, requires the integration of categories. The theory development was focused on the third research question.

The theory grounded on the empirical data of Case 2 is divided into two parts: guidance of the strategic projects and general facilitating factors. The first part includes the guiding process with its most essential outcomes. The second part, general facilitating factors, includes the most central issues related to both the learning community and the work community. Both parts of the theory are visualized in figures showing conditions, actions, and consequences. Some points can be conditions and consequences at the same time. Arrows are used to describe the main causal relations. However, there are so many interacting variables that it is impossible to include all the relations in the figures. Only the most important relations arising from the research material are presented.

Guidance of the strategic projects

The first part of the guidance was to ensure the preconditions for successful guiding. The subjects of the strategic projects were known in advance, and the guide had a sufficient amount of knowledge, skills, and experience in the subject area. This enabled elaboration of the projects, e.g. by first finding one way to do the projects before the projects started.

The second phase was to give information and tools (methodological and physical) to the groups so that the subjects were understood and they had at least some ideas about possible methods. In this phase the management's role was extremely important. The fact that different top managers openly presented the acute problems which the subjects were based on appeared to affect the motivation and commitment of the participants very positively.

In the third phase the participants got to know each other and the subject, and the team formation started. Here the facilitator's supporting role appeared to be especially important. He learned to know every participant, gave advice, followed the development of team working skills, had a great many informal discussions with the participants, and took care of the atmosphere. However, in spite of all this, the support for teamwork was not considered sufficient.

After the starting phases in phase four the amount of information was increased. By presenting many different viewpoints the guide created a state similar to chaos. The mentors often helped in this just by telling about the subject area, in this way showing how complicated it was. The incoherent state which was created appeared on the one hand to foster questioning and idea generation, and on the other hand to increase despair.

The next phase, phase five, was hard work. The structure for the project was supposed to be formulated in this phase, and if not, the guide gave rather strong recommendations about it. In some cases, when the group appeared to be lost, his role changed from coach to strong instructor who clearly showed the direction. Especially in phase five many mentors gave valuable help by giving their networks for use and helping the groups to get confidential information.

Phase six could be called a refinement phase where the guide supported the groups in the formulation of the presentations. The main goal was to get the most essential issues clearly out and make the presentations interesting. There may be a danger in this phase if the guide leads the work too much.

The last phase of guiding was phase seven, which took place in the Evaluation workshop where the top management was invited to hear the results. Here the guide supported the presentations in many ways, e.g. by introducing the subject, by asking questions which clarified the essential points and by binding the different presentations into an interesting entity. He also briefly evaluated each presentation to the whole audience. The management had a prominent role in this phase because they decided which results were to be utilized in the organization. They invited some groups to give additional presentations, and in this way selected them to be disseminated. In some cases the management wanted to utilize the outcome of the work, but in others also the competencies the group had developed. The groups appeared to have much to offer: they had solutions, new ideas and ways of thinking, networks across the organization, and versatile competencies on both substance and teamwork. However, the management did not appear to be able to fully utilize these. The groups often wanted a better evaluation of the results and more careful consideration as to

which results were worth disseminating and where. The guidance process is presented in Figure 6.

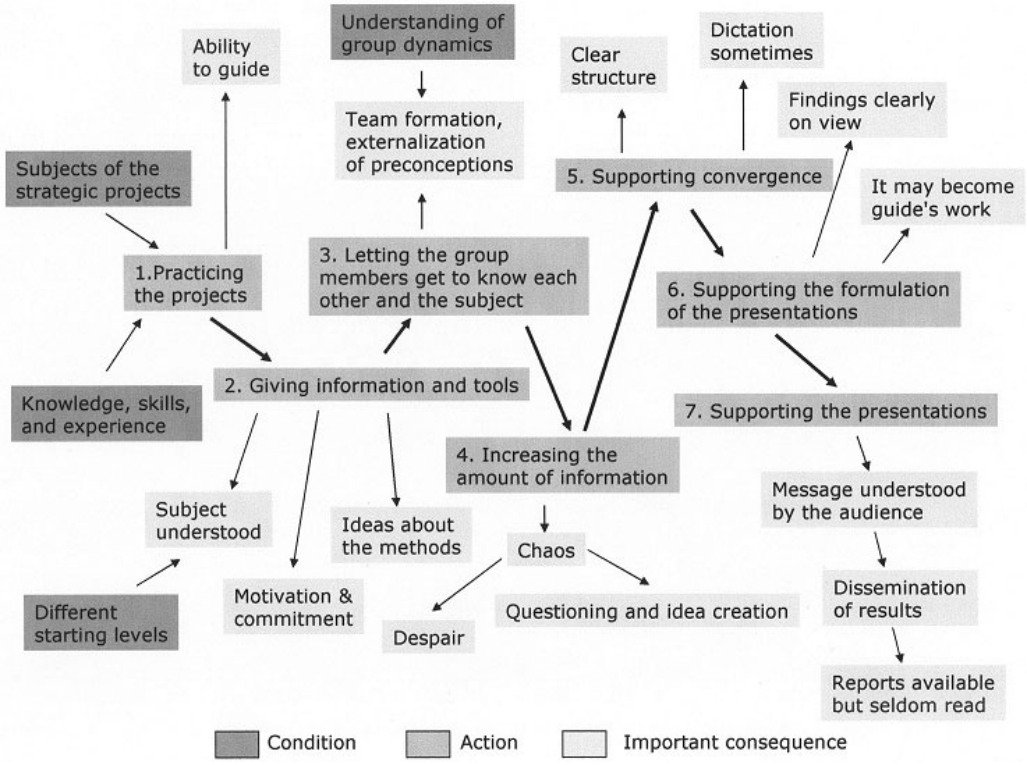

Figure 6 The guidance process

General facilitating factors

The most important general facilitating factors found were related to the learning community and work community of the course participants.

In the learning community the composition of the group is an important issue. Two criteria were used when placing the participants into groups: no participants from the same organizational unit, and, if possible, no similar learning styles to the same group. This brought very different participants together and created difficulties in finding a common language. Getting to know each other helped in this, but it usually only succeeded after long discussions. Everyone had time pressures and therefore it was quite generally felt that more support, especially in the starting phase of the team formation, would have been needed. Even if the facilitator tried to help, it was not felt sufficient. Progressing towards the strategic goal was very slow at the beginning. Learning to know each other probably created trust, which affected the atmosphere by improving possibilities to discuss more sensitive issues. This appeared to enable the independence of

the group and ability to question issues. However, utilization of differences could have been much better.

One reason for the poor utilization was that teamwork knowledge and skills developed too slowly, mainly by using "learning by doing"-method without much theoretical help. This way the working methods did not develop in as versatile a way as possible. Also the atmosphere is an important facilitator of good teamwork. Trust and humor appeared to affect it positively in addition to the social skills of the participants in the group. The facilitator tried to improve the atmosphere by interventions and by offering different kinds of activities and evening programs. These appeared to work at least partly. However, the best evening activities appeared to be the informal discussions between participants after they had got to know each other. The factors of the learning community affecting the success of the case are described in Figure 7.

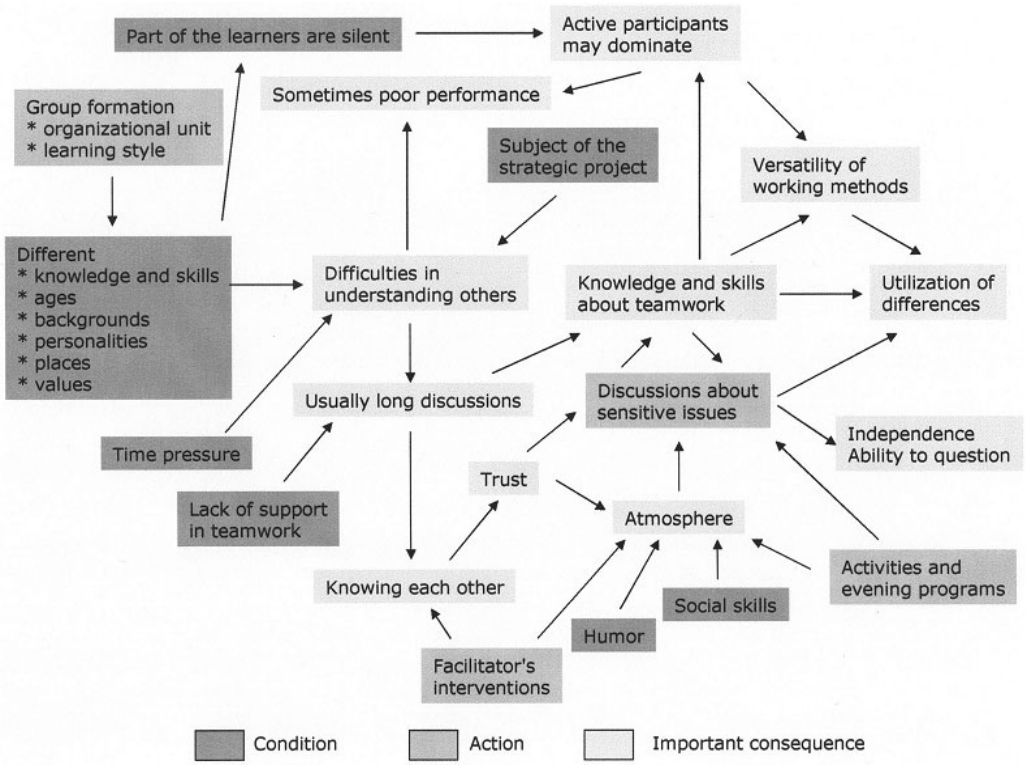

Figure 7 Factors of the learning community affecting the success of the case

In the work community the superior of the learner is the key person. Firstly, the superior should have knowledge of the issues handled in the course and about the time needed for the course, and secondly, he should see to it that the wanted outcome is discussed together to produce a shared vision and goals for the course. There were too many examples of bad surprises when the superior noticed how much time the participation really required. Planning the participation together does not guarantee that it is possible to have enough time for it, but it at least appeared to make the time pressure easier to stand. A

shared understanding of goals also appeared to enable opportunities to exchange knowledge between the participant and the working community, thus improving possibilities to utilize the new knowledge and skills achieved. This is hardly possible if the superior does not have a positive attitude and support for the participation. One way which was used to create a positive attitude was to offer the superiors the opportunity to participate in the course events. However, even if offered, this opportunity was hardly used. Crucial for the development of new knowledge and skills is also openness of information needed for the strategic projects. The factors of the work community affecting the success of the case are described in Figure 8.

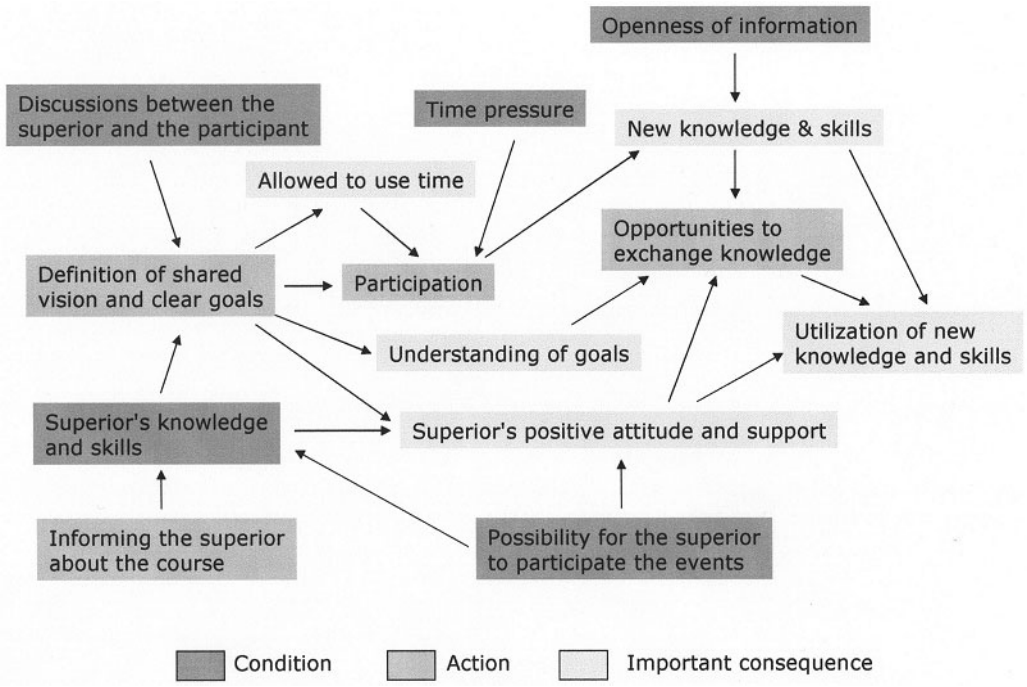

Figure 8 Factors of the work community affecting the success of the case

This ends the exploration of the cases. In the next chapter, Chapter 4, the theoretical framework is further developed based on the results of the exploration phase. These results will be used to focus the literature review on the most essential issues making the development of the general model possible.

4 Literature review: Refining the theory

4.1 Starting point and next research questions

It is not difficult to find theories that support the exploration phase. On the contrary, the difficulty is in choosing the most relevant ones related to learning and its organizational issues. Therefore first some main findings from the exploration phase and some epistemological issues are needed to guide the search for theories.

The real **context**, where the acquired skills and know-how are supposed to be used, was clearly present in both cases in Chapter 3. The context appeared to create the framework where it was possible to integrate theory, or formal knowledge, and practice. In both cases it was supported in different ways. In Case 1 shared orientation and experiences from the problems presented affected the formation of context. The problems were first easier but always connected to situations similar to the real world. This context could be called a simulated reality. In Case 2 the context was reality itself, the present situation and real problems which the management had. The situation was presented by the management and then elaborated in the strategic projects with the help of the guide and the mentors.

In both cases different learning communities had a considerable role. It appeared to be possible to utilize different backgrounds, different know-how, and even the different learning styles of the participants if the participants of the group were able to **collaborate**.

The cases clearly revealed that the work community and especially participants' superiors strongly affect the final outcome: the utilization of the results **in the organization**. The contextuality did not appear to guarantee that the learning results could be utilized in the organization.

In both cases some work experience was required before the **individuals** could attend the courses. They also needed the acceptance and recommendation of their superiors, and in Case 2 they had to fit in the quota reserved for their larger organizational unit. In Case 2 the groups were formed so that the participants represented different organizational units and had different learning styles to as great an extent as possible. This was, however, not always successful.

In Case 1 **guidance** was based on both traditional instruction and coaching-like activities. The course had a predefined program which was changed whenever needed. Some self-controlled learning was required of the participants. In Case 2 guidance had seven phases as described in Figure 6. In addition to the guide the other central roles in guidance were, *mentor* (expert supporting the group), *principal* (representative of the management), *superior*, and *facilitator*

(supporting learning and the course in general). Many successful guiding interventions were observed in both cases.

The main findings from the exploration phase can be crystallized into five items:

- strong effect of **context** on motivation and commitment
- efficiency of **collaboration** in learning
- inadequacy of even real contexts to guarantee the utilization of learning results in the **organization**
- challenges in understanding what should be taken into account concerning **individuals** in contextual collaborative learning
- versatility of possible **guiding** interventions in a contextual collaborative learning process

These above-mentioned five subjects, context, collaboration, organization, individuals, and guidance were chosen for further elaboration. Each of them is dealt with in separate chapters where relevant theories supporting the understanding of the cases are presented. The subject areas are summed up in Figure 9 and the next research questions are presented in Table 8.

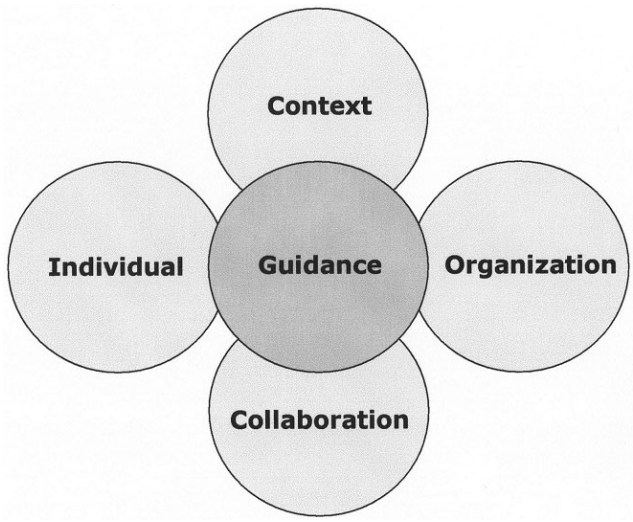

Figure 9 Subjects for further elaboration

Table 8 Research questions of the literature review

Main question:
What kind of general model could support the implementation of contextual collaborative learning in an enterprise environment?
Subquestions:
What kind of theoretical evidence can be found to support the importance of **context** in learning, and what kind of disadvantages can contextuality have? What different possibilities are there to utilize contexts?
What kind of theoretical evidence can be found to support the importance of **collaboration** in learning, and what kind of disadvantages can collaboration have? What is needed to facilitate collaboration?
What factors concerning **individuals** should be taken into account in contextual collaborative learning?
What is needed to ensure the utilization of learning results in the **organization**?
How should **guidance** be carried out? How could the whole program of contextual collaborative learning be facilitated?

Before diving in the subject areas and searching for theories from literature, some epistemological issues and guidelines are worth considering. The context of the work is an enterprise environment. Therefore the most valuable knowledge can be seen as something viable that works in practice. Further, it is hard to believe that any knowledge interpreted as truth in an enterprise environment could be something else than what most people agree on. The truth can also change when the environment changes and learning occurs. It is constructed in the minds of the people and based on previous knowledge. It cannot either be in contradiction with itself. These views represent pragmatism and constructivism (Dewey, 1916, von Glasersfeld, 1995b). The main approach to theories is constructivism, where a central issue is the development of meaning through understanding. The important factors found in the cases, i.e. contextuality and community, will be taken into account by emphasizing the Vygotskyan sociocultural form (Tynjälä, 2000), and there especially situational forms of constructivism represented by Lave and Wenger (Lave & Wenger, 1991, Wenger, 1998). Their central message is that learning is a social phenomenon and it cannot be extracted from its social, cultural, and historical context. However, the individual point of view is also considered. As Salomon and Perkins (1998) state, individual and social learning complement each other, and even in the sociocultural approach individual learning plays a critical role. The sociocultural forms of learning emphasize participation (e.g. Brown, Collins & Duguid, 1989, Lave & Wenger, 1991, Greeno, 1998). However, according to Sfard (1998) the traditional knowledge acquisition metaphor should be remembered as well because it offers help in some important issues like transfer of knowledge (carrying knowledge across contextual boundaries). "When one refuses to view knowledge as a stand-alone entity and rejects the idea of context as a clearly delineated "area", there is simply nothing to be carried over, and there are no definite boundaries to be crossed." (Sfard, 1998, p. 9). Bereiter (2002) calls the acquisition metaphor a mind-as-a-container metaphor and criticizes it having trouble "dealing with any sort of knowledge that cannot be understood as an

object in an individual mind." (Bereiter, 2002, p. 20). As an example he presents a learning group which resembles a research group investigating real questions and where students are trying to contribute to the progress on those questions. Within the traditional framework, he states, real collaborative knowledge-building cannot be supported. Not even the participation metaphor offers solution to this because it is, according to Bereiter, not capable of distinguishing between the situated knowledge inherent in the practices of a group and the nonsituated knowledge which is the transferable product of the group's work. Bereiter emphasizes the importance of treating ideas as real things out in the world, as conceptual artifacts like material artifacts (Bereiter, 2002, p. 209). The knowledge is this way not represented only in the minds of the students. This, according to Bereiter (1997), solves the problem of transfer also: outside artifacts can be transferred across contexts.

In this work knowledge is seen as a product and property of both an individual and a community, and the learner is both an individual and a community. Even if individuals are committed to shared goals of a community and build knowledge as an outside artifact, it is believed here that they are also interested in keeping up their personal "market value" or employability, which is directly related to individual expertise, or, in other words, content of their own minds including beliefs, understandings, skills etc.

Learning in this work is defined as participation in social practice and as cognitive change within an individual. According to Wenger (1998, p. 95) learning through participation includes evolving forms of mutual engagement in the practice of a community, understanding and tuning the enterprise, and developing the repertoire, styles, and discourses of the community.

The five subject areas of Figure 9 are dealt with in separate chapters. The new research questions presented above are discussed based on the theories from literature. After that the model of facilitating contextual collaborative learning is presented and its consistency checked in Chapter 5. Chapter 6 then concludes the research with discussion.

4.2 Context

"The context of an idea or event is the general situation that relates to it, and which helps it to be understood" (Collins Cobuild English Dictionary, 1995). This sentence tells the most essential: context helps understanding, it gives meaning. Educational systems have been criticized for developing knowledge which can be used only to pass exams with no value in real working life (e.g. Resnick, 1987, Brown, Collins & Duguid, 1989, Bereiter & Scardamalia, 1993). Referring to Alfred North Whitehead some authors (e.g. Brown, Collins & Duguid, 1989, Bereiter & Scardamalia, 1993) call this kind of knowledge "**inert knowledge**". "It is knowledge that people have stored in memory and that they comprehend at some level - they can give sensible answers to questions about it - but it serves no function in their lives. It does not play any role in practical activity or in making sense of experience in the world." (Bereiter & Scardamalia, 1993, p. 63). Brown, Collins, and Duguid (1989) state that abstract concepts cannot be taught independently of authentic situations, and that understanding is developed through continued situated use of knowledge. They consider conceptual knowledge similar to a set of tools. "They can only be fully understood through use, and using them entails both changing the user's view of the world and adopting the belief system of the culture in which they are used." (Brown, Collins, and Duguid, 1989, p.33). Explicit rules are not enough to learn to use them. They see that activity, concept, and culture are interdependent, and learning must involve all three.

To understand the idea of contextual or situated learning (learning in authentic situations) better the concept of knowledge requires closer study. Collins, Brown, and Newman (1989) distinguish between **domain knowledge** and **strategic knowledge**. According to them, domain knowledge includes the conceptual and factual knowledge and procedures explicitly identified with a particular subject matter. Strategic knowledge, they say, is usually tacit knowledge (unexplicit expert knowledge) that underlies an expert's ability to make use of concepts, facts, and procedures when solving problems and carrying out of tasks. In strategic knowledge they include problem-solving strategies and heuristics, strategies that control the problem-solving process, and learning strategies that experts use when acquiring new concepts, facts, and procedures.

Bereiter and Scardamalia (1993) see several types of knowledge behind expertise:

- **formal knowledge** or declarative knowledge, which is explicit, can be discussed and is created through social processes of justification, criticism, and argument. Although formal knowledge is inert, it has several important functions (Bereiter & Scardamalia, 1993, p. 63-65): it is essential for dealing with issues of truth and justification, it is important for communication, teaching, and learning, and it provides starting points for the construction of informal knowledge and skills.
- **procedural knowledge** is visible through skills. Ordinary skills are well automated and difficult to describe in an explicit form. The automated parts of procedural knowledge can be thought of as hidden informal knowledge.

According to Bereiter and Scardamalia formal knowledge is converted into skill by being used to solve problems of procedure (Bereiter & Scardamalia, 1993, p. 66)

- **hidden or tacit knowledge** includes four different kinds of knowledge:
  - **informal knowledge or practical knowledge** can be seen as a kind of elaborated and specialized form of common sense. Formal knowledge is converted into informal knowledge by being used to solve problems of understanding (Bereiter & Scardamalia, 1993, p. 66).
  - **impressionistic knowledge** is knowledge of feelings through which it is possible to remember things and make quick decisions. One of its functions is to support the acquisition of formal knowledge by connecting it to feelings, but more important, according to Bereiter and Scardamalia, is that it provides a basis for practical and theoretical judgements. By relying on impressions it is possible to take several constraints into account at the same time in quick decision-making. Impressionistic knowledge can be called intuition and instinct as well.
  - **self-regulative knowledge** is self-knowledge relevant to performance in some domain, but it is not knowledge of that domain. It is knowledge that controls the application of other knowledge and it is often referred to as metaknowledge or metacognition. (Bereiter & Scardamalia, 1993, p. 60)
  - **knowledge of promisingness** is related to creativity and can be seen as one type of impressionistic knowledge. Bereiter and Scardamalia also see creativity as progressive problem-solving. In a creative process, however, the step from existing knowledge to the goal is much longer and riskier than in normal development of expertise. When succeeding in this kind of risk taking one develops a kind of knowledge that increases one's likelihood of success. Bereiter and Scardamalia call this "knowledge of promisingness".

In Bereiter's newer book (Bereiter, 2002) he renames three of the above-mentioned types and adds one new type: He speaks about **statable knowledge** instead of formal knowledge to emphasize its explicit nature (p. 137). Procedural knowledge is replaced by **skills** because Bereiter wants to include the sub-cognitive component (the inevitable change in any skill that takes place with practice) in the notion in addition to the procedural knowledge which he calls the cognitive component of a skill (p. 143). Self-regulative knowledge is shortened to **regulative knowledge** because, according to Bereiter, there is regulative knowledge that pertains to collective activity also (p. 145). The new type of knowledge, **episodic knowledge**, was added because Bereiter sees the recall of past experiences an important part of knowledgeability. In the subsequent discussion, however, the older type names are used because they are better known as concepts.

Bereiter and Scardamalia have adopted the **connectionist** or neural model of brain functioning, which makes it possible to explain the development of all kinds of the above-mentioned knowledge types through progressive problem-solving. Progressive development in pattern recognition, e.g. when using impressionistic knowledge, makes it possible to increase complexity in decision-making. The

patterns do not need to be understandable units to work as constructive elements. Explication of hidden knowledge would be easier if the knowledge existed as facts and rules. In connectionistic thinking, however, the knowledge exists as patterns of neural connections. The facts and rules must be created and therefore explicated knowledge is always an approximation of the real, existing knowledge.

Referring to Bereiter and Scardamalia (1993) and some other sources, Tynjälä (1999, p. 359-360) concludes that expert knowledge can be divided into three main components: formal knowledge, practical (or procedural) knowledge, and self-regulative knowledge. She also states that the integration of these components of expert knowledge into learning and into the development of professional expertise has received an increasing amount of attention in recent literature. She considers it congruent with the views of several learning theorists that knowing and doing are inseparable.

Nonaka and Takeuchi developed a theory on organizational knowledge creation (Nonaka & Takeuchi, 1995, p. 56-94). Their cornerstone is the distinction between **tacit** and **explicit** knowledge: "human knowledge is created and expanded through social interaction between tacit knowledge and explicit knowledge." Nonaka and Takeuchi emphasize that this "knowledge conversion" is a social process between individuals and not confined within an individual. They postulate four different modes of knowledge conversion: tacit -> tacit (socialization), tacit -> explicit (externalization), explicit -> explicit (combination), and explicit -> tacit (internalization). The content of the created knowledge depends on the mode of knowledge conversion: they speak about symphatized knowledge (product of socialization), conceptual knowledge (product of externalization), operational knowledge (product of internalization), and systemic knowledge (product of combination). According to them the different contents of knowledge interact with each other in the spiral of knowledge creation. The basis of organizational knowledge creation is the tacit knowledge of individuals. Nonaka and Takeuchi state that by "mobilizing" this tacit knowledge it is amplified in the organization through the four modes of knowledge conversion and crystallized at group, organization, and inter-organization levels. "… organizational knowledge creation is a spiral process, starting at the individual level and moving up through expanding communities of interaction, that crosses sectional, departmental, divisional, and organizational boundaries." (Nonaka & Takeuchi, 1995, p.72)

Bereiter (2002) speaks about knowledge building. He sees it as knowledge work with conceptual artifacts similar to any work with real artifacts. In his opinion one should make "a clear distinction between the situated knowledge inherent in the practices of any productive group and the nonsituated knowledge which for some groups is the exportable product of their work and for other groups is the stuff they work with." (Bereiter, 2002, p. 204-205). However, the meaning of the knowledge always comes from understanding its use, and in this way also unsituated knowledge sooner or later becomes situated in some context. If this does not happen, it is dismissed as useless.

As the views presented above show, knowledge can be seen as a product and property of both an individual and a community. Also nonsituated knowledge exists, but these abstract conceptual artifacts are only thoroughly understood through some context. In all cases the benefits of the context appear evident. **Meaningful strategic or tacit knowledge cannot be achieved without context.**

The context for learning has several levels of concreteness (Coles, 1997). The highest level could be one's own experience, but lower levels can be useful as well. An expert doing or experiencing something can be shown or, with lower levels, notes, history, or some framework can be given to the learners. An example of lower level contextuality is **problem-based learning**. Boud and Feletti (1997) describe it as follows: "It is a way of conceiving of the curriculum as being centred upon key problems in professional practice. Problem-based courses start with problems rather than with exposition of disciplinary knowledge. They move students towards the acquisition of knowledge and skills through a staged sequence of problems presented in context, together with associated learning materials and support from teachers." (Boud & Feletti, 1997, p. 2).

An example of a higher level of contextuality is **cognitive apprenticeship**, which Brown, Collins, and Duguid (1989) propose as an alternative to the criticized traditional learning practices. This method tries to enculturate students into authentic practices through activity and social interaction. "Cognitive apprenticeship supports learning in a domain by enabling students to acquire, develop, and use cognitive tools in authentic domain activity." (Brown, Collins, and Duguid, 1989, p. 39). The term apprenticeship, according to the authors, emphasizes the activity and context-dependent, situated, and enculturating nature of learning.

Lave and Wenger (1991) have developed the old idea of craft apprenticeship emphasizing that "learning is an integral and inseparable aspect of social practice." Their theory describes the process by which newcomers become part of a **community of practice**. They write about "**legitimate peripheral participation**" emphasizing that the newcomer has to be a legitimate member of the community to have real access to it. The right starting point is in the periphery where it is possible to participate in the community by producing value but doing easy tasks. They see that conferring legitimacy is more important than providing teaching. Learning can occur without teaching and without formally organized apprenticeship. "Learners, as peripheral participants, can develop a view of what the whole enterprise is about, and what there is to be learned. (Lave & Wenger, 1991, p. 93)" They say that from the peripherial perspective apprentices gradually assemble a general idea of what constitutes the practice of the community.

Practice is defined by Wenger (1998) as doing in a historical and social context that gives structure and meaning to what is done. The concept includes both the explicit and the tacit. It includes the language, tools, documents, etc. that various practices make explicit, but it also includes all the hidden signs of

membership in a community. "Practice is, first and foremost, a process by which we can experience the world and our engagement with it as meaningful." (Wenger, 1998, p. 51). All that e.g. a learning community do and say may refer to what has been done and said in the past, and yet they produce meanings that negotiate anew the histories of meanings of which they are part. This is a constant process which is called **negotiation of meaning** (Wenger, 1998, p. 52). This negotiation constantly changes the situations to which it gives meaning and affects all learners. This way meaning is the product of its negotiation, and it exists in the process of negotiation. The negotiation of meaning is, according to Wenger, a result of two processes: **participation** and **reification**. Participation is defined as the social experience of living in the world in terms of membership in social communities and active involvement in social enterprises (Wenger, 1998, p. 55). It is a process that combines doing, talking, thinking, feeling, and belonging. Reification is defined as treating an abstraction as substantially existing, or as a concrete material object. Its power is in focusing the negotiation of meaning. The meanings are projected into the world and then perceived as existing there and as having a reality of their own. The process of reification is central to every practice because they produce abstractions, tools, symbols, stories, terms, and concepts that reify something of that practice in a congealed form (Wenger, 1998, p. 59). Reification can refer both to a process and its product. It should be remembered that the reification as a constituent of meaning is always incomplete, ongoing, potentially enriching, and potentially misleading (Wenger, 1998, p. 62). Reification can be described as a useful illusion. Participation and reification cannot be considered in isolation: they are a pair. The face-to-face interactions e.g. in the learning community can be seen as a process of participation and reification. Shared concepts or even words are reifications but they are useless without participation. The tight interweaving of reification and participation makes conversations a powerful form of communication. Reification is also an important factor in developing expertise at an individual level. It helps free capacity in the working memory by defining larger and more complex entities to be handled as conceptual units.

Wenger defines three dimensions of the relation by which practice is the source of coherence of a community (Wenger, 1998, p. 73-85):

1. mutual engagement. Practice exists because people are engaged in actions whose meaning they negotiate with one another. Membership in a community of practice is a matter of mutual engagement.
2. joint enterprise. Daily practice is a complex collectively negotiated response to what is understood to be the situation. The enterprise is joint in that it is communally negotiated. This gives rise to relations of mutual accountability among the members.
3. shared repertoire. The repertoire of a community of practice includes both reificative and participative aspects which the community has produced or adopted.

To open up a practice, peripheral participation must provide access to all three dimensions of practice mentioned above. The curriculum is the community of practice itself (Wenger, 1998, p. 100). Newcomers must be granted enough legitimacy to be treated as potential members.

Wenger (1998) sees the communities of practice as a living context that can give newcomers access to competence and at the same time produce a personal experience of engagement affecting the identity of the participant. Because learning transforms what the learners are and what they can do, Wenger sees it as an experience of identity. According to him learning "entails a process of transforming knowledge as well as a context in which to define an identity of participation. As a consequence, to support learning is not only to support the process of acquiring knowledge, but also to offer a place where new ways of knowing can be realized in the form of such an identity." (Wenger, 1998, p. 215). As a whole, Sfard's view to see both acquisition and participation metaphors of learning essential agrees with Wenger's views (Sfard, 1998).

In addition to participation and non-participation one may have ability to shape the meanings that define communities. Therefore Wenger (1998) defines a duality of identification/negotiability. By **identification** he means the process through which the above-mentioned modes of belonging become constitutive of one's identity by creating bonds or distinctions in which one becomes invested (Wenger, 1998, p. 191). By **negotiability** Wenger refers to the ability, facility, and legitimacy to contribute to, take responsibility for, and shape the meanings that matter within a social configuration (Wenger, 1998, p. 197). Negotiability, for example allows one to make meanings applicable to new circumstances. Identification is defined with respect to communities and forms of memberships in them, and negotiability with respect to social configurations and one's positions in them.

There are many different opinions about transfer[18] of knowledge achieved in contextual or situational learning (e.g. Brown, Collins & Duguid, 1989, Anderson, Reder & Simon, 1996, Greeno, 1997, Bereiter, 1997, 2002, Gruber, Law, Mandl & Renkl, 1999). In general, it appears that the only thing researchers agree on, is that the transfer of knowledge is challenging. Bereiter (1997, 2002) solves the problem of transfer by utilizing his idea of knowledge building. Abstract conceptual artifacts can be built as a collaborative work of knowledge building, and they are the "exportable" elements between different contexts. They are tools used for understanding. Bereiter emphasizes that knowledge building does not automatically mean learning, although it usually leads to it. Learning happens when the constructed artifacts are used by learners to change their beliefs, understanding, skills, etc. He makes a clear distinction between knowledge-building as productive work, learning through knowledge-building, and learning to be a knowledge builder (Bereiter, 2002, p. 296).

[18] Transfer occurs when something learned at one time is applied later in another context. (Kauchak & Eggen, 1998, p. 270)

4.3 Collaboration

"Collaboration is the act of working together to produce a piece of work, especially a book or some research." (Collins Cobuild English Dictionary, 1995). According to the same dictionary, the concept cooperation, has almost the same definition: "If you co-operate with someone, you work with them or help them for a particular purpose." However, in association with learning these words usually have different meanings. Cooperative learning is seen here as a teacher-facilitated learning method where the teacher creates possibilities for cooperative learning building on good principles like mutual benefit and positive interdependence (Johnson, Johnson, & Holubec, 1990). The method can be classified in the category of "Active social mediation of individual learning" (Salomon & Perkins, 1998) where a group helps an individual to learn and knowledge is seen as a product and property of an individual. Collaborative learning, on the other hand, is defined here as a more self-controlled activity of group-based problem-solving where problems form the context. The facilitator, if one exists, has no superior knowledge of the substance area, and the resulting knowledge benefits the group most as a unit but also the individuals. This learning method could be classified in the category of "Social mediation as participatory knowledge construction" according to the classification of Salomon and Perkins (1998). This category represents a sociocultural viewpoint, which is the basis of this work. It is worth noting that participatory knowledge construction here includes both the relations inside the group and relations over group and organizational boundaries.

Collaboration can be seen as social interaction which combines both intentional goal-oriented action and distributed intelligence or cognition of the group. The cognitive burden is shared between the participants, and different kinds of reifications are used as tools to make the cognitive load easier to handle (Pea, 1993). The apparent benefit compared to individual learning is the amount of cognitive resources available. The social process of negotiation of meaning is important in supporting conceptual changes at an individual level (Hakkarainen, Lonka & Lipponen, 1999). In the model of organizational knowledge creation by Nonaka and Takeuchi (1995) social interaction is also crucial. **Socialization**, the knowledge conversion from tacit knowledge to tacit knowledge, happens through observation, imitation, and practice, not with the use of language. Shared experiences, embedded in emotions and specific contexts are essential. **Externalization**, the knowledge conversion from tacit to explicit, is, according to Nonaka and Takeuchi (1995), done by using metaphors, analogies, concepts, hypotheses, or models. They state that using analytical methods of deduction or induction is often impossible whereafter externalization is driven by metaphor and/or analogy. It is hard to imagine especially these two modes of knowledge conversion being implemented without social interaction. Collaboration is one way of advancing these knowledge conversions and it appears quite natural to embed the conversions in collaborative processes. Collaboration also makes it possible to explain concepts, theories, ideas, thoughts, etc. to other participants, thus facilitating reflection, deep understanding, and learning (Perkins, Crismond, Simmons & Unger, 1995). Collaboration feeds innovations through different

backgrounds and viewpoints of the participants (Ståhle, 1999), and it creates, as a result of regular interaction with others, satisfaction through strong emotional and social ties (Buchanan & Huczynski, 1997, p. 274).

There is no doubt that collaboration would not be beneficial as a way of learning. As described in the previous chapter, the highest level of contextuality is one's own experience in an authentic situation, and it is possible to implement it through legitimate peripheral participation (Lave & Wenger, 1991). It is also clear that a learning group consisting only of beginner learners is not the best possible context, although it has its benefits, e.g. building knowledge as a collaborative process is probably easier when the participants have equal starting points. Therefore an interesting possibility would be to combine the ideas of community of practice and learning group so that each learner would be a legitimate member in a community of practice working in the target area of expertise, at the same time, belonging to the learners' own group. Informal groups in the organization in the learners' home units would be one alternative for the communities of practice, but as the cases in Chapter 3 showed, they do not necessarily come into question. First, the home units often represent different kinds of expertise from innovative learning targets, secondly, the learners may already be experts in their own units being this way unable to find any new viewpoints there, and thirdly, the home units are often business units with very strong emphasis on short-term business goals in some narrow area, and cannot therefore support wider perspectives of expertise very much.

The ideas of learning group and community of practice are studied next. The starting point is the learning group as a group. The presumption is that the groups are self-managed consisting of people with some experience from working life. Issues like group formation, structure and process, control, effectiveness, work process, interpersonal process, and design characteristics are dealt with in connection with trying to find answers to the problems which came up in the cases in Chapter 3. After that the theory of communities of practice is studied in order to find conditions and procedures for the intentional utilization of ordinary groups and communities of practice in collaborative learning.

The group[19] in general is characterized by the following properties (Buchanan & Huczynski, 1997, p. 188):

1. A minimum membership of two people
2. A shared communication network (each member should be capable of communicating with every other member)
3. A shared sense of collective identity (each group member must identify with the other members of the group)
4. Shared goals (achievable only by the members working together)
5. Group structure (roles, norms, and rules)

[19] Group is defined here as a psychological group which means that people interact with each other, are psychologically aware of each other, and perceive themselves to be a group (Buchanan & Huczynski, 1997, p. 187).

The learning group is seen here as a formal group which is created by the institutional organization for a collective purpose. Douglas McGregor presents eleven "common sense" features of an effective group (McGregor, 1960). These features which appear to be present also in "Effective Behavior in Organizations" by A.R. Cohen, S.L. Fink, H. Gadon & R.D. Willits (Buchanan & Huczynski, 1997, p. 203) as "issues facing any workgroup", are used here as a framework for closer examination. The features are (McGregor, 1960, p. 232-235) (direct quotations):

1. "The "atmosphere", which can be sensed in a few minutes of observation, tends to be informal, comfortable relaxed. There are no obvious tensions. It is a working atmosphere in which people are involved and interested. There are no signs of boredom."
2. "There is a lot of discussion in which virtually everyone participates, but it remains pertinent to the task of the group. If the discussion gets off the subject, someone will bring it back in short order."
3. "The task or the objective of the group is well understood and accepted by the members. There will have been free discussion of the objective at some point until it was formulated in such a way that the members of the group could commit themselves to it."
4. "The members listen to each other! The discussion does not have the quality of jumping from one idea to another unrelated one. Every idea is given a hearing. People do not appear to be afraid of being foolish by putting forth a creative thought even if it appears fairly extreme."
5. "There is disagreement. The group is comfortable with this and shows no signs of having to avoid conflict or to keep everything on a plane of sweetness and light. Disagreements are not suppressed or overridden by premature group action. The reasons are carefully examined, and the group seeks to resolve them rather than to dominate the dissenter."
6. "Most decisions are reached by a kind of consensus in which it is clear that everybody is in general agreement and willing to go along. However, there is little tendency for individuals who oppose the action to keep their opposition private and thus let an apparent consensus mask real disagreement. Formal voting is at a minimum; the group does not accept a simple majority as a proper basis for action."
7. "Criticism is frequent, frank and relatively comfortable. There is little evidence of personal attack either openly or in a hidden fashion. The criticism has a constructive flavour in that it is oriented toward removing an obstacle that faces the group and prevents it from getting the job done."
8. "People are free in expressing their feelings as well as their ideas both on the problem and on the group's operation. There is little pussyfooting, there are few "hidden agendas". Everybody appears to know quite well how everybody else feels about any matter under discussion."
9. "When action is taken, clear assignments are made and accepted."
10. "The chairman of the group does not dominate it, nor on the contrary, does the group defer unduly to him. In fact, as one observes the activity, it is clear that the leadership shifts from time to time, depending on the circumstances. Different members, because of their knowledge or experience, are in a position at various times to act as "resources" for the group. The members

utilize them in this fashion and they occupy leadership roles while they are thus being used."

11. "The group is self-conscious about its own operations. Frequently, it will stop to examine how well it is doing or what may be interfering with its operations." "Whatever it is, it gets open discussion until a solution is found."

In the following each of the items is discussed and related views from other sources of literature are presented. The question to be answered is: what makes a learning group good and how can this kind of a group be collected. The headings are taken from Buchanan & Huczynski (1997, p. 268) where the features of McGregor are in a shortened form.

1. *"An informal, relaxed atmosphere in the group which shows that members are involved and interested."*

The leadership style (White & Lippitt, 1960) and satisfaction through group cohesion (Buchanan & Huczynski, 1997, p. 275) appear, according to literature, to affect the atmosphere. White and Lippitt stated in their research that a democratic leadership style appeared to lead to stronger motivation and better originality than an autocratic or laissez-faire style leadership, but the amount of work was somewhat greater in autocracy. In democracy there was also more group-mindedness and friendliness: group-minded remarks, friendly remarks, mutual praise, and friendly playfulness were more frequent (White & Lippitt, 1960, p. 87-88). Based on these results one can expect self-management of the group to have a positive affect on the atmosphere. Group cohesion is the degree to which members of a group feel attracted to their group and are motivated to stay in it (Bettenhausen, 1991, p. 361). According to Buchanan and Huczynski (1997, p. 274) satisfaction is among the positive consequences of high level cohesion. Cohesiveness can be task-oriented or team-oriented (Yeatts & Hyten, 1998, p. 98). The former is reported to increase commitment to work and in that way increase effort placed directly on the work (Bettenhausen, 1991). Zaccaro and Lowe (1988) call the latter interpersonal cohesion, which according to them increases members' commitment to one another with both positive and negative effects. A positive effect is increased effort, whereas the time team members spend discussing other than work-related subjects is negative.

2. *"Full participation by all members in the discussion which remains focused upon the task."*

The size of the group is an important factor affecting participation. Yeatts and Hyten (1998, p. 60) report that large teams develop factions within the teams that spent energy competing for control of the team. Large teams also caused reduced feelings of personal responsibility. According to Yeatts and Hyten (1998, p.84) a team size from six to eight members appeared to be best for high-level communication. Referring to Brightman (1988) they state that at this size, all or most members are encouraged to communicate, and communication among them is relatively frequent. Focus upon the task correlates with task-oriented cohesion (Bettenhausen, 1991), and both task-oriented and team-oriented cohesion facilitates discussion (Yeatts & Hyten, 1998, p. 98). Cohesion and discussion appear to go hand in hand needing and feeding each other.

3. *"Acceptance by all of the group objective."*

Yeatts and Hyten (1998) state referring to different goal theorists that goal commitment is generally highest when people think they can attain the goals and when the attainment has value for them (Yeatts & Hyten, 1998, p. 246). They continue by saying that according to their research the team goals were clearest and most challenging when developed jointly by the team and management. It is also reasoned (Hackman & Walton, 1986, Katzenbach & Smith, 1993) that commitment will be higher where employees can tailor the goals to their own values and interests. Engeström (1999) emphasizes that the problem or task given by the management is never so clear that it would not need group questioning, confrontation, and debate. This also makes innovativeness possible. Peter Senge (1990) calls one of his five disciplines "shared vision" because, as he writes, a set of principles and guiding practices to translate individual vision into shared vision are lacking. Those "shared pictures of the future", according to him, foster genuine commitment and enrolment instead of pure compliance.

4. *"Members listen to each other and are not afraid to make creative suggestions."*

Yeatts and Hyten noticed that in low-performing teams some team members typically dominated team decision-making, even where other team members had more talent with regard to the particular subject being considered (Yeatts and Hyten, 1998, p. 69). They see training of communication skills as the most important single environmental factor affecting communication (Yeatts and Hyten, 1998, p. 82) and noticed that some organizations offer communication training that also includes training in listening. Training and coaching can also provide team members with the skills to study conflict and learn to handle it productively (Yeatts and Hyten, 1998, p. 91). Referring to Kouzes and Posner (1987), Yeatts and Hyten (1998, p. 102) state that trust has the positive consequence that team members are willing to consider also alternative viewpoints during the decision-making process. Without trust the information system is not complete. Senge (1990) writes (referring to Bohm) a great deal about the differences between dialogue and discussion. In his opinion a learning team should master movement back and forth between dialogue and discussion. In dialogue they seek a richer understanding of complex issues by listening to each other carefully, and discussion is needed when a team must reach agreement and make decisions (Senge, 1990, p. 247).

5. *"Disagreements are not swept under the carpet but fully discussed and either resolved or lived with."*

Doise and Mugny use the notion of sociocognitive conflict in their research about social development of the intellect (Doise & Mugny, 1984). They see it as a cognitive conflict in social communication which, when resolved in social interaction, appears to lead to conceptual change. Amason (1996) distinguishes cognitive conflict and affective conflict. When conflict is task oriented and focused on differences how best to achieve common objectives, it is called cognitive conflict (Amason, 1996, p. 127). When conflict is emotional and focused on personal incompatibilities or disputes, it is called affective conflict (Amason, 1996, p. 129). According to Amason (1996) cognitive conflict improves

decision quality and is also positively related to understanding and affective acceptance. Affective conflict, on the contrary, had a negative effect on decision quality and affective acceptance. Jehn (1995) speaks about task-related conflicts and relationship conflicts and has similar kinds of findings. She also noticed that beneficial effects of task-related conflicts were observed only in groups performing non-routine tasks, and if the level of conflict was not too high. High levels of conflicts appeared to interfere with group performance. "Members became overwhelmed with the amount of conflicting information and continuously became side-tracked and lost sight of the main or original goal of the discussion." (Jehn, 1995, p. 275). According to her, relationship conflicts were detrimental regardless of the type of the group task. However, she also noticed that the members involved in relationship conflicts chose to avoid working with those with whom they experienced conflicts, and this way the conflicts did not always influence work much.

6. *"Most decisions are reached by consensus."*

Consensus as a decision-making process is usually said to lead to win-win decisions, which are high-quality, creative, innovative, and which create commitment and motivation (e.g. Yeatts & Hyten, 1998, Rees, 2001). This is seen to happen because of the long discussions seeking solutions which are acceptable to all. "Consensus as a decision-making process is advantageous to the extent that the decision is important to the team's performance, there is time available to reach a consensus, and it is important that team members be committed to the decision reached." (Yeatts & Hyten, 1998, p. 301).

7. *"Criticism is frank and frequent without degenerating into personal attacks."*

As already stated in item 5, affective conflicts should be avoided. Cognitive conflicts improve decision quality and are positively related to understanding and affective acceptance (Amason, 1996). According to Yeatts & Hyten (1998, p. 102), high trust affected that team members spent less energy worrying about others' thinking and concentrate on doing the work.

8. *"People are free to express their feelings about both the task and the group's mode of operation in achieving that task."*

Rees (1997) points out that each team member must maintain his/her uniqueness as an individual. His message is that in a healthy group all the members are not alike. Belbin (1993) speaks about team roles defining them as "a tendency to behave, contribute, and interrelate with others at work in certain distinctive ways." (Belbin, 1993, p. 24). These individual differences should be utilized. According to his theory individuals will most likely have one or two team roles to which they are ideally suited and the roles can change according to the situations. A good team is balanced so that it has several team roles represented and it is aware of the missing roles. Each role has its strengths but also weaknesses. Belbin speaks about "allowable weaknesses" and "not-allowable weaknesses" (Belbin, 1993, p. 51). Allowable weaknesses are weaknesses always present if the strength of the role is utilized. The other members of the team should stand it and understand that correcting it would undermine the real strength. However, sometimes the weaknesses can get out of hand and the other members do not have to allow that. Also, if people feel

that they are not free to express their feelings and, at the same time, group cohesion is high, there is a danger of groupthink[20].

9. *"Actions are clearly assigned to group members and are carried out by them."*

Rees (1997, p. 111) emphasizes five points to be important when the team decides who will do what tasks: tasks should be assigned based on members' strengths and preferences, opportunities to develop skills should be offered, diversity should be utilized, less desirable tasks should be shared or rotated, and someone should take responsibility for the overall coordination of the team's effort. Yeatts and Hyten (1998, p. 87-88) also consider coordination extremely important to a team's performance. Referring to their case studies they stated: "Unless each team member is clear as to his or her roles and responsibilities, team member efforts become guesswork as to what should be done." (Yeatts & Hyten, 1998, p. 272). Katzenbach and Smith (1993) state that effective teams develop strong commitment to how they will work together.

10. *"Leadership within the group shifts from time to time and tends to be based on expert knowledge rather than on formal status or position."*

Yeatts and Hyten (1998, p. 304-305) have collected advantages of rotating the team leader position: It encourages the leadership development among less dominant team members, it facilitates the development of the whole team, and, with the experience of being a team leader, members get an excellent viewpoint to the problems and challenges of the group and to the concerns of management. Rotating leadership also encourages the team leaders to better serve the interests of other members because they will soon be ordinary members again. The disadvantages in leadership rotation is the repeated learning time before full leadership performance is achieved, which can result in reduced productivity. Yeatts and Hyten (1998, p. 303) state that experienced self-managed work teams can select their own leaders. At the beginning, however, it is beneficial that management makes the appointment.

11. *"The group is self-conscious about its own operation and regularly reviews the way it goes about its business."*

Yeatts and Hyten (1998, p. 281) found monitoring measures of team performance extremely important. According to their observations, high-performing teams had performance goals through measurable criteria and monitored their success during weekly team meetings. By monitoring their own performance, team members, according to Yeatts and Hyten, "appeared to take ownership of any performance problems and to take on responsibility for improving areas that were not up to performance goals."

It is amazing to notice how well these 11 features of an effective group which McGregor presented in 1960 still apply over 40 years later. Rees (2001) has identified ten essentials for teamwork. These are (Rees, 2001, p. 33):

[20] "Groupthink is a mode of thinking that people engage in when they are deeply involved in a cohesive in-group, when the members' strivings for unanimity override their motivation to appraise realistically the alternative courses of action." (Buchanan & Huczynski, 1997, p. 283)

- Common goals
- Leadership
- Interaction and involvement of all members
- Maintenance of individual self-esteem (each person's contribution must be heard, valued, and acknowledged)
- Open communication
- Power within group to make decisions
- Attention to process and content
- Mutual trust
- Respect for differences
- Constructive conflict resolution

These items appear to be fully covered by McGregor's features. One reason for the similarity may be that McGregor dealt with management teams in his book (McGregor, 1960). They were naturally self-directive, they were able to set their goals, and had independence and power in decision-making. Those features appear to be very similar in contemporary ordinary groups which are empowered to be rather self-directive in solving problems related to their work and in developing their working methods.

The selection of group members typically focuses on work experience, educational level, and references (Yeatts & Hyten, 1998, p. 272). This is not necessarily the best way. Belbin (1993) emphasizes the importance of taking the suitability of the candidate into account, not only eligibility. By suitability he means the team-role fit between the person and the job, and the team the person is coming to. According to Belbin it is easier to develop suitable "semi-eligibles", fitting candidates with lack of complete eligibility, than non-fitting candidates who are eligible (Belbin, 1993, p. 41). In his research Belbin found team role behavior to consist of six factors: personality, mental abilities, current values and motivation, field constraints, experience, and role learning (Belbin, 1993, p. 28). Even if people learn to modify their role behavior to take the situation into account, each person has a tendency to one or two preferred roles. According to Belbin, these tendencies should be tested and utilized when building a team. It should also be understood which roles are good in which tasks. Belbin states that a good team needs a combination of different roles, and self-awareness of the participants about their own preferred roles. Boer and During (2001) see the existence of different roles as an important condition for innovation. They state that different roles are needed in different phases of the innovation process, and therefore the role needs should be remembered when selecting people for tasks requiring innovativeness.

What is then the difference between an ordinary group or team and a community of practice? Collaborative learning groups, as described in Case 2, had a specified task and clear boundaries to the organizational environment. Members of the group had been selected and the goals of the project held them together. The project has a predetermined ending although the informal network usually continues to exist. Communities of practice differ from these groups in several ways (Wenger, McDermott & Snyder, 2002, p. 42): Instead of accomplishing a specified task, communities of practice create, expand, and exchange knowledge and develop individual capabilities. Members belong to the community through

"self-selection based on expertise or passion for a topic". The boundaries are fuzzy and the group is held together by "passion, commitment, and identification with the group and its expertise". They can even last long depending on the relevance of the topic. A community of practice consists of three elements (Wenger, McDermott & Snyder, 2002, p. 27-29): a domain of knowledge, a community, and shared practice. The domain is important in creating common ground and "a sense of common identity". A community creates cohesion and is important because of the belonging, which is part of situational learning. The practice includes "frameworks, ideas, tools, information, styles, language, stories, and documents" shared by the community members.

In general, the benefits of communities of practice are twofold: Firstly, they produce an excellent context for learning, as described in the previous chapter, and, secondly, they can greatly help in management of knowledge. Being more global than business units, they connect local sources of expertise and individual experts. They are good **in their domain** in seeing the entire picture and in solving problems crossing organizational units. They are able to concentrate on knowledge rather than on short-term business goals. The challenge is that when the communities of practice deepen their knowledgeability they create boundaries to other communities and to the business organization. It is possible that they begin to live their own life without caring about organizational targets. They negotiate their own meanings and cannot therefore be directly created and controlled by the institutional organization. A big organizational challenge is to enable crossing of boundaries to other communities and to the business organization. This is possible with common boundary objects or brokers (Wenger, 1998), who are members in several communities including the business organization. Therefore boundaries should be focused on and multimembership valued. Communities of practice can also suffer from the same phenomena as teams do, e.g. strong cohesion can lead to groupthink.

Developing a community of practice is not straightforward. A community of practice is by definition natural, spontaneous, and self-directed (Wenger, McDermott, and Snyder, 2002, p. 51). However, a deliberate design is possible even if the results cannot be guaranteed. Wenger, McDermott, and Snyder (2002, p.51) have derived seven design principles from their experiences for communities of practice:

1. "Design for evolution": Design should catalyze the community's natural evolution.
2. "Open a dialogue between inside and outside perspectives": Design should bring information from outside the community into the inside dialogue about what the community could achieve.
3. "Invite different levels of participation": Wenger, McDermott, and Snyder (2002, p. 57) divide the community of practice into three areas: core group, active group, and peripheral group. The peripherial members can utilize the context for their learning as described in the previous chapter. They can also be very valuable by bringing in new ideas from other communities they are members in. This kind of multimembership is more difficult for core group members who represent a very deep level of expertise in the domain of the community.

4. "Develop both public and private community spaces": Strong individual relationships make the community events richer. The public and private dimensions go hand in hand supporting each other.
5. "Focus on value": A key element of designing for value, according to Wenger et al., is to encourage community members to make the value of the community explicit. Communities should create events, activities, and relationships that help their potential value emerge. Early value usually, according to the authors, comes from focusing on current problems and needs of community members. After that it is often found important to have a systematic body of knowledge and its development starts.
6. "Combine familiarity and excitement": Wenger et al. (2002, p. 62) state: "Lively communities combine both familiar and exciting events so community members can develop the relationships they need to be well connected as well as generate the excitement they need to be fully engaged."
7. "Create a rhythm for the community": A suitable strong heartbeat of the community shows that the community is alive.

In the next chapter the perspective is changed to the individual. The main question there is: what factors of individuals should be taken into account in contextual collaborative learning.

4.4 Individual

According to Bereiter and Scardamalia (1993) expertise develops through progressive problem-solving. This means continual reinvestment of mental resources freed, e.g. from conscious actions which become automated, to the efforts of getting higher levels of competence and achievement. In this context the word “problem” is understood as "any goal which one does not yet know how to achieve". Bereiter and Scardamalia perceived that experts, when faced with unfamiliar cases, constructed new concepts and methods, wheras non-experts force-fitted the cases to their existing routines (Bereiter & Scardamalia, 1993, p.

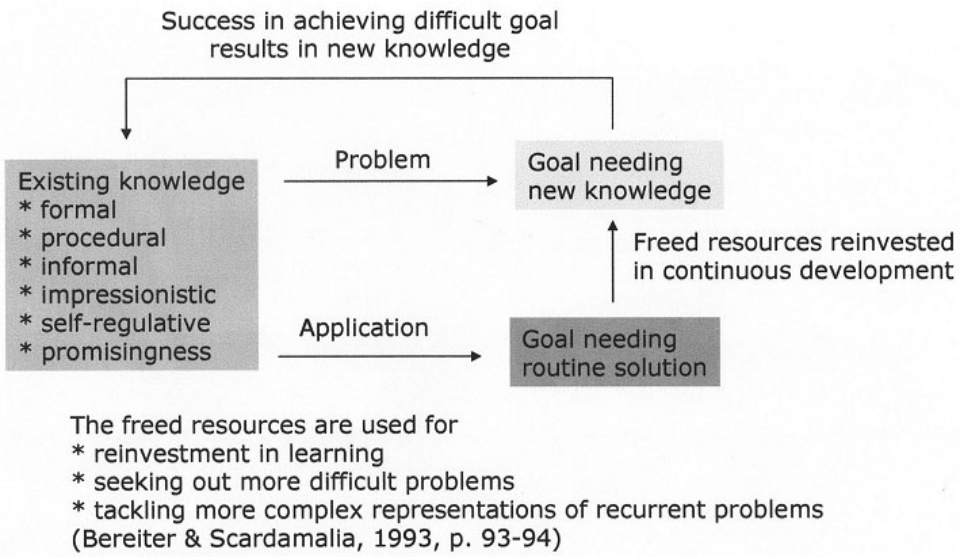

Figure 10 Expert’s way to solve problems

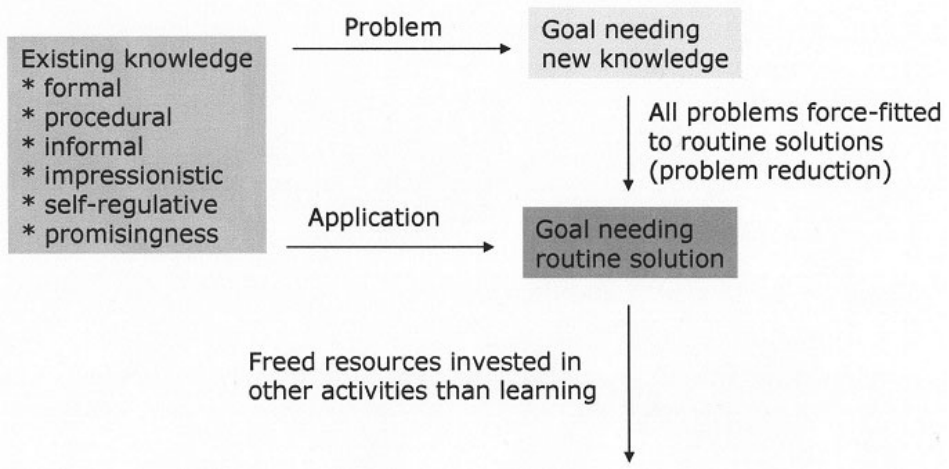

Figure 11 Way of experienced non-expert to solve problems

100). "Acquiring expert knowledge entails working to some extent at the edge of one's competence, accepting the strains and risks that go with doing so, but gaining in return progressively higher levels of competence and achievement (Bereiter & Scardamalia, 1993, p. 73)". "Experts tackle problems that increase their expertise, whereas non-experts tend to tackle problems for which they do not have to extend themselves." The expert's and non-expert's way of working with problems is outlined in Figures 10 and 11.

After discussing the importance of context and participation in Chapter 4.2 it is easy to accept the above-mentioned ideas of Bereiter and Scardamalia. It is clear that a traditional approach to finding knowledge and skills needed to fill the competence gaps and running separate courses to train them, is not the best possible. What is typically lacking from those approaches is the possibility to progress through questions of the learner and the possibility to elaborate the issues considered important. Sandberg (2000) criticizes the typical training approach based on a set of attributes which experts see important in the job. In his opinion the most fundamental guiding principle that facilitates the development of competence at work is the worker's conception of his/her work, not a set of abilities and knowledge. His idea is that different learning interventions should be designed and conducted so that they promote the wanted changes in workers' conceptions of their work taking into account at the same time the abilities and knowledge found important.

Bereiter and Scardamalia call an environment supporting progressive problem-solving a "second order environment". This means an environment, where the conditions to which people must adapt change progressively as a result of the successes of other people in the environment. If a community of practice (Wenger, 1998) develops fast putting its energy freed from routine practice to continuous development, it is one kind of "second order environment". However, some level of expertise is already needed to gain admittance to this kind of environment even as a peripheral member, and therefore the community of practice does not necessarily foster early development of expertise. What kind of factors then contribute to developing the required level of expertise for gaining admittance to a suitable "expertise self-feeding" environment?

Working in an enterprise environment already offers some context and community useful for learning from the very beginning. People learn just by being present in the workplace. A newcomer can develop as a competent expert without any kind of formal training just by observing others and asking questions. What is called for, however, is **motivation**[21]. The general motivational factors from a social cognitive perspective can be divided in two groups (Pintrich, Marx & Boyle, 1993):

1. Learner's motivational beliefs about his/her reasons for choosing to do a task (value components including **goal orientation**, **interest**, and **importance**)

[21] "Motivation is the general term for all the processes involved in starting, directing, and maintaining physical and psychological activities." (Zimbardo, McDermott, Janz & Metaal, 1995).

2. Motivational beliefs about one's capability to perform a task (expectancy components including **self-efficacy**, **attributions**, and **control beliefs**)

Pintrich, Marx and Boyle (1993) discuss these motivational factors in a classroom context. Their results and conclusions may not be directly applicable in an enterprise environment but the factors can also be found there.

Goal orientation means that goals like intentions and purposes in general are assumed to guide learners' behavior, cognition, and affect (Pintrich, Marx & Boyle, 1993).

Interest refers to the learner's general attitude for the content or task, and **importance** to the learner's perception of the significance of the content or task to him/her (Pintrich, Marx & Boyle, 1993).

Self-efficacy[22] refers to the learner's confidence in his/her own learning and thinking strategies (Pintrich, Marx and Boyle, 1993, p. 186).

Attributions for success and failure are related to achievement motivation. They are interpretations and beliefs about the reasons events turn out the way they do. According to Zimbardo, McDermott, Janz, and Metaal, (1995) (referring to Bandura) explanations of accomplishment are more central than the actual successful or unsuccessful performance. Beliefs about reasons for success or failure lead to different interpretations of past performance, which may lead to different motivation in the future.

Control beliefs refer to individuals' beliefs about how much control they have over their behavior or the outcome of their performance (Pintrich, Marx and Boyle, 1993, p. 188).

Emotions[23] have motivational effects as well. Motivation may cause emotions, and emotions can themselves be motivating forces. Especially important in learning is that emotions occurring in a particular situation tend to become associated with that context in memory. This may cause learners to approach or avoid certain situations in the future (Zimbardo, P., McDermott, M., Janz, J. & Metaal, N, 1995, p. 380).

Bereiter (2002, p. 328) emphasizes the importance of intrinsic motivation to learning but warns at the same time that intrinsic interest should not be reduced to subject matter, activities, or self-expression. That means that learning interventions should not be based only on inherently interesting topics, enjoyable activities, or personal problems.

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[22] Self-efficacy means "beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations." (Pajares, 1996, referring to Bandura)

[23] Emotion mean various enjoyable or distressing mental states and processes. It is thought of as a complex pattern of bodily and mental changes (physiological arousal, feeling tone, cognitive processes, and behavioral reactions) made in response to a situation perceived as personally significant. Emotions include feelings or affects. (Zimbardo et al., 1995, p. 381).

According to the discussion in this chapter progressive problem-solving combined with the right motivational beliefs appears to be a suitable framework for development of expertise. Progressive problem-solving reveals the need of deeper knowledge where formal knowledge has an important role. "Relevant formal knowledge can play a crucial role in hastening the process and getting it going in a direction that will prove useful." (Bereiter & Scardamalia, 1993, p. 65). Formal knowledge is also important when justificating the solution and when searching for new information. The vocabulary and structure of the field must be known to make justification and searching possible. (Bereiter & Scardamalia, 1993). Progressive problem-solving facilitates the conversion from formal knowledge to skills (procedural knowledge) and informal (tacit) knowledge[24]. According to Bereiter and Scardamalia (1993, p. 66) "formal knowledge is converted into skill by being used to solve problems of procedure" and "into informal knowledge by being used to solve problems of understanding." This appears to solve the problem of highly situational or contextual learning how to fit formal knowledge into the situative learning process. Procedural and informal knowledge are easier to understand as natural outcomes of situational or contextual learning, but the role of formal knowledge is not always so clear.

Jan D. Vermunt (1998) studied the impact of mental learning models, learning orientations, and regulation strategies on the knowledge processing strategies of an individual. By using factor analysis he identified four learning dimensions or learning styles (undirected style, reproduction-directed style, meaning-directed style, and application-directed style) which represented typical combinations of components in four main areas (cognitive processing strategies, metacognitive regulation strategies, mental models of learning, and learning orientations) (see Figure 12).

Cognitive processing strategies refer to activities learners use "to process learning contents and to attain their learning goals by doing so" (Vermunt, 1998, p. 151). They lead directly to learning results. **Metacognitive regulation**, according to Vermunt, means regulation of the cognitive activities leading to learning results indirectly. A **mental model of learning** is seen by Vermunt as a coherent whole of learning conceptions including learning and thinking activities, conceptions about oneself as a learner, conceptions of learning objectives and tasks, conceptions of the task division in the learning process. With **learning orientation** Vermunt refers to the whole domain of personal goals, intentions, motives, expectations, attitudes, worries, and doubts of learners.

Progressive problem-solving represents a cognitive processing strategy, which could be classified as "concrete and deep processing" in Vermont's classification (Vermont, 1998, p. 158). Metacognitive regulation was briefly mentioned in

[24] Note that Tynjälä (1999) as referred to in Chapter 4.2 combines the concepts of procedural knowledge (explicit knowledge of know-how) and informal knowledge (one type of tacit knowledge) by Bereiter and Scardamalia (1993) under the concept of practical knowledge (tacit knowledge of know-how). If not separately mentioned the knowledge type definitions of Bereiter and Scardamalia are used in this work.

Chapter 4.2 as self-regulative knowledge. It was one knowledge component of Bereiter and Scardamalia (1993) and one of Tynjälä's (1999) main components of expertise.

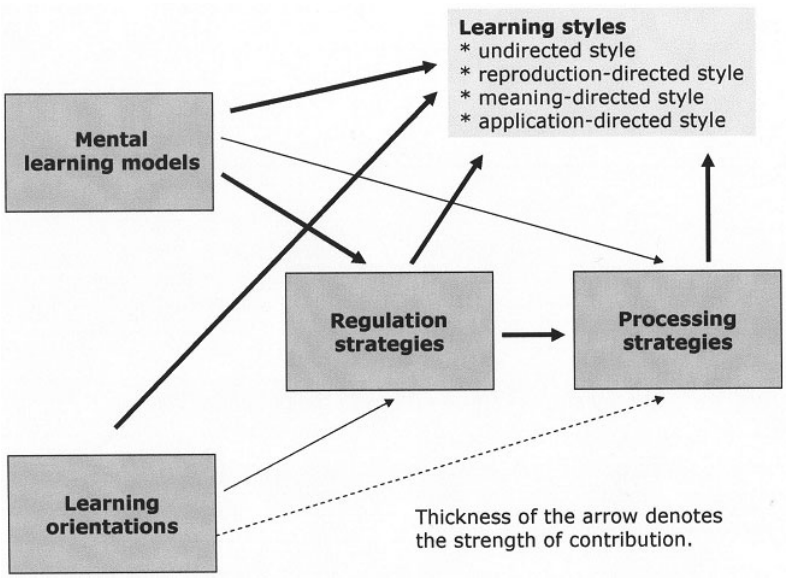

Figure 12 Model of the regulation of individual's learning process (Vermunt, 1998)

Vermunt (1998) found that a mental learning model, which he called "construction of knowledge", leads to a self-regulative regulation strategy which further facilitated any kind of processing strategy. External regulation and a reproduction-directed learning style had a strong connection. External regulation also appeared to lead to analytical, stepwise advancing processing strategies. Learning orientations appeared to have the weakest contributions to both regulation strategies and processing strategies. Mental learning models had a strong contribution to regulation strategies, and regulation strategies in turn to processing strategies (Vermunt, 1998). Vermunt concludes that the control over the learning process should be transferred from the teachers to the learners, and therefore the learning processes of learners should be focused on. Rather than direct instructions for influencing learners' use of good processing strategies he recommends influencing through regulation strategies. This can be done by teaching self-regulation and at the same time influencing the mental learning models of learners in the direction of a knowledge constructing view.

According to Hattie, Biggs, and Purdie (1996) the training of study skills should be connected to teaching of content. It helps in applying the strategies in similar situations and also ensures better understanding of conditions under which the strategy works. This most probably applies to group dynamics and collaborative skills as well.

4.5 Organization

The fourth important area which came up in the cases of Chapter 3 was utilization of the learning results in the organization. Learning in context, even if found as an effective learning method, did not appear to guarantee that the results would be adopted and that the organization would fully benefit from the learning investment. Therefore, the main purpose of this chapter is to find organizational design and action issues critical for the utilization of the learning results achieved.

Nonaka and Takeuchi (1995) present an organizational model which they call "the hypertext organization". The basic idea is that a business organization needs a nonhierarchical, self-organizing structure working in tandem with its hierarchical formal structure (Nonaka & Takeuchi, 1995, p. 166). In accordance with its name, the hypertext organization includes interconnected layers which are interpreted as different contexts. The model has three layers: the business system, the project team, and the knowledge base. The business system is the central layer organized as a hierarchical pyramid to conduct routine work effectively. The project team is the top layer in the model with several project teams working in knowledge-creating activities, such as in development of new products. The team members are from the units of the business system, and are assigned exclusively to a project team until the project is completed. The knowledge-base layer is at the bottom and its purpose is to recategorize and recontextualize the knowledge created in the two layers above. The bottom layer has no real implementation. It exists only as embedded in corporate vision, organizational culture, or technology. This way, according to Nonaka and Takeuchi, three totally different layers or contexts coexist within the same organization, and it is easy for the members of the organization to shift context. The idea supports the knowledge conversions presented in Chapter 4.2: The bureaucratic business layer, dealing mainly with operational and systemic knowledge, implements, exploits, and accumulates new knowledge through internalization and combination, while the project team layer, dealing mainly with conceptual and sympathized knowledge, uses socialization and externalization (Nonaka & Takeuchi, 1995, p. 170). The team layer brings dynamism to the stability of the business layer. The authors call the knowledge base layer a clearinghouse of the knowledge created in the other layers.

Tuomi (1999) suggests that the knowledge-base layer of the model by Nonaka and Takeuchi should be replaced by a set of communities of practice. "Instead of conceptualizing the knowledge-base layer as a repository of organizational knowledge it needs to be conceptualized as a set of communities of practice" (Tuomi, 1999, p. 409). He would like to interpret this layer as a social meaning processing space which also participates in creation of new knowledge. Nonaka and Takeuchi state that people need to have a "home-base" at the business system layer. Tuomi says that in addition to that, people need a home-base also at the community level. In his opinion also membership and participation in the communities need to be managed within the organization. Tuomi also presents

an idea to combine the community of practice and team constructs, and call the resulting unit an organizational community, where "some of the members of the community are given organizational responsibility over some of the activities of the community". (Tuomi, 1999, p. 400) The purpose of organizational communities is to combine the processes for knowledge creation and accountability needed for the organizational level distribution of work and responsibility.

Wenger, McDermott, and Snyder (2002) speak about "double-knit" organization. They see that communities stewarding knowledge and the business processes where knowledge is applied must be tightly interwoven (Wenger, McDermott, and Snyder, 2002, p. 18). According to them, the dual roles of people as community practitioners and as operational team members "help link the capabilities of communities of practice to the knowledge requirements of teams and business units." People are both accountable for performing tasks and developing a practice in a community. Wenger, McDermott, and Snyder also emphasize the importance of home-base or "home for identity" as they call it. They see communities of practice as the only stable layers because business units are constantly being reorganized, and projects come and go with teams being assembled and split up continuously.

In all the models described in this chapter the importance of multimembership is emphasized. It facilitates several viewpoints: the business goal oriented viewpoint of business units, the task goal oriented viewpoint of a group or a task force, and the knowledge creation viewpoint in a community of practice or embedded in corporate vision, organizational culture, or technology. It appears to cover all the necessary aspects needed for an organization to base its learning. However, it does not tell how knowledge and skills needed for participation in a community of practice or task force can be achieved. It is also possible that in spite of multimembership, seeing and understanding the organizational entity is difficult. As stated in Chapter 4.2 understanding develops through participation in the context. If none of the contexts offer possibilities to engage in the activities concerning the whole organizational entity, not much understanding of it will develop. Goals in the business units are usually narrow and short-term for natural reasons. The units are part of the organization and have specific goals. They have to focus on their business area and adapt themselves to changes in their business environment. Groups or task forces are task-oriented and usually see only one narrow viewpoint how their work will benefit the organization. Communities of practice can totally lose connection with organization because their main interest is in development of knowledge. When deepening their knowledge and negotiating their meanings constantly, it is easy to drift apart from the organizational goals. Different contexts are important, and one of them should be dealing with the organizational entity level strategic issues. Also, the development of knowledge needed for an individual to survive in different communities representing the different contexts must be remembered.

Next, literature about facilitating learning in organizations is briefly referred to. Nonaka and Takeuchi (1995, p. 73-83) discuss five conditions required at the organizational level:

- **intention**: organizational intention drives knowledge creation. It should be formulated and proposed to employees.
- **autonomy**: all employees should be allowed to act autonomously as far as circumstances permit. This way the organization may increase the chance of introducing unexpected opportunities.
- **fluctuation and creative chaos**: fluctuation causes a "breakdown" of routines, habits, or cognitive frameworks, and in this way questions the validity of the basic attitudes toward the world. Creative chaos refers to intentional chaos, which increases tension within the organization and focuses the attention of employees on defining the problem and resolving the crisis situation.
- **redundancy**: redundancy means the information that goes beyond the immediate operational requirements of employees. It speeds up the knowledge creation process because sharing redundant information promotes the sharing of tacit knowledge. Redundant information also helps in building unusual communication channels.
- **requisite variety**: employees can cope with many future uncertainties if they have "requisite variety". Their internal diversity then matches the complexity of the environment. This can be improved, according to Nonaka and Takeuchi by combining information differently, flexibly, and quickly, and providing equal access to information throughout the organization.

For management of organizational knowledge creation, Nonaka and Takeuchi (1995) propose a model which they call middle-up-down. Its idea is that knowledge is created by middle managers, who are often leaders of a team or task force, through a process involving both the top and the front-line employees (Nonaka & Takeuchi, 1995, p. 127). The process positions the middle managers at the intersection of the vertical and horizontal flows of information within the company. "They serve as the strategic "knot" that binds top management with front-line managers. They work as a "bridge" between the visionary ideals of the top and the often chaotic realities of business confronted by front-line workers." (Nonaka & Takeuchi, 1995, p. 128). Wenger would call them brokers between two communities. Nonaka and Takeuchi further describe that the main job of middle managers is to orient the chaotic situation of the front-line toward purposeful knowledge creation. This is done "by providing their subordinates with a conceptual framework that helps them make sense of their own experience." Top management's task is to create vision which is then interpreted by middle management into more concrete concepts that front-line employees can understand and implement.

Wenger presents a learning architecture (Wenger, 1998, p. 230-240) based on four dimensions of the challenge of designing for learning, and on the three modes of belonging which should be facilitated to enable learning. The four dimensions, challenges of design, correspond to the fundamental issues of meaning, time, space, and power, as follows:

1. **Participation and reification** (meaning)
   "Design for practice is always distributed between participation and reification – and its realization depends on how these two sides fit together." (Wenger, 1998, p. 232). A design should be distributed between participation and reification. That affects the negotiation of meaning.
2. **The designed and the emergent** (time)
   According to Wenger, the relation between design and practice is always indirect. "Practice cannot be the result of design, but instead constitutes a response to design." (Wenger, 1998, p. 233). He also warns that increasingly detailed prescriptions of practice have increasing risks of being turned around. Emergent is needed as an opportunity to negotiate a better meaning.
3. **The local and the global** (space)
   Practice is always local because it is not possible to achieve deep engagement (continuous negotiation of meaning) on a larger scale. However, design can help in creating relations among localities in their constitution of the global (Wenger, 1998, p. 234). Design can be seen "as a boundary object that functions as a communication artifact around which communities of practice can negotiate their contribution, their position, and their alignment." (p. 235).
4. **Identification and negotiability** (power)
   According to Wenger, design is a proposal of identity. It creates a focus for identification or non-identification, and it is a bid for ownership of meaning (Wenger, 1998, p. 235). Design "may seek a realization by restricting negotiability and refusing to share the ownership of its meaning; or, on the contrary, it may endeavor to share this ownership and endow all involved with enough negotiability to decide how to participate in the process meaningfully." (p. 235).

Engagement in practice is not the only mode of belonging to a community of practice. In addition to it Wenger defines two others (Wenger, 1998, p. 174): imagination and alignment. When engagement means active involvement in mutual processes of negotiation of meaning, the two others mean belonging by creating images of the world (imagination) and by coordinating energy and activities in order to fit within broader structures (alignment). Imagination is needed when trying to understand issues outside of the practice one is engaged in, e.g. success stories of the company. Through alignment one becomes part of something big by doing what it takes to play one needed part in it, e.g. by adapting to some organizational needs. According to Wenger, a learning architecture must offer facilities for each of the three modes of belonging.

Facilities of **engagement** can be divided into mutuality, competence, and continuity (Wenger, 1998, p. 237-238). Mutuality includes interactional facilities, joint tasks, and peripherality (e.g. ways of belonging to various degrees). Competence includes initiative and knowledgeability, accountability, and tools (e.g. artifacts that support competence). Continuity consists of reificatice memory (e.g. repositories of information), and participative memory (e.g. apprenticeship systems).

Facilities of **imagination** can be divided into orientation, reflection, and exploration (Wenger, 1998, p. 238). Orientation includes location in space (e.g. maps), location in time (e.g. museums), location in meaning (e.g. stories), and location in power (e.g. organizational charts). Reflection includes among other things facilities for comparisons, conversations, and sabbaticals. Exploration offers, for example, opportunities and tools for trying things out.

Facilities of **alignment** can be divided into convergence, coordination, and jurisdiction (p. 238-239). Convergence can be helped with e.g. common focus, vision, values, leadership. Coordination includes standards and methods, communication, boundary facilities (e.g. boundary practices), and feedback facilities (e.g. data collection). Jurisdiction includes e.g. policies and contracts.

According to Wenger's theory organizational learning should be integrative, i.e. focus on practice and seek points of leverage where design can support learning. Learning should be a process of participation. Therefore engagement of communities in the design of their practice as a place of learning is very recommendable. Communities also need resources to negotiate their connections with other practices and their relation with the organization (Wenger, 1998, p. 249). Boundaries should be focused on and multimembership valued. Wenger states that richness of boundary processes is a sign of learning. Imagination is needed when going to global issues beyond engagement in practice. This can be fostered e.g. by offering material for belonging. Alignment with the institutional organization is ideal if it allows the practices to locate themselves in the constellation of other practices and give them negotiability (allow them to participate in the negotiations of meaning concerning the entity).

More classical theories on organizational learning do not appear to cause confusion. As an example, Argyris & Schön (1996, p. 16) define organizational learning as follows:

> *"Organizational learning occurs when individuals within an organization experience a problematic situation and inquire into it on the organization's behalf. They experience a surprising mismatch between expected and actual results of action and respond to that mismatch through a process of thought and further action that leads them to modify their images of organization or their understandings of organizational phenomena and to restructure their activities so as to bring outcomes and expectations into line, thereby changing organizational theory-in-use. In order to become organizational, the learning that results from organizational inquiry must become embedded in the images of organization held in its members' minds and/or in the epistemological artifacts (the maps, memories, and programs) embedded in the organizational environment."*

The definition agrees with Wenger's definition. The individuals just operate within a community of practice. They continuously negotiate meanings or solve problematic situations and in this way modify their understandings of organizational phenomena. Because the whole community is engaged in the activity there are no problems in bringing the outcomes into line. Also the reifications develop all the time and the learning results are this way embedded in them. The only problem may be that it is difficult for the other part of the

organization to understand and benefit from the learning of a community of practice. However, good alignment with the rest of the organization helps in this problem.

4.6 Guidance

"Guidance is help and advice." (Collins Cobuild English Dictionary, 1995). The term guidance is selected for this work as a general enough concept of facilitating learning. It is seen to include other expressions used for supporting learning, e.g. teaching, instruction, coaching, scaffolding, tutoring, mentoring, etc. It also indirectly indicates the constructivistic viewpoint that the learners are responsible for their learning and other people can only support it. Guidance cannot be the responsibility of only experts in the relevant substance areas. As stated in the previous chapters, facilitation of learning covers several areas. For example, a suitable context should be found, members of learning groups should be selected carefully, communities of practice should be fostered, alignment with the organizational entity should be taken care of, etc. Guidance is a collaborative process where also top management, human resource development professionals, middle management, and superiors of the learners should participate.

In this chapter guidance is discussed in the light of the four preceding chapters. The question is how context, collaboration, the individual, and the organization should be taken into account in the implementation of guidance. Finally fostering of creativity is dealt with as one important issue related to guidance.

4.6.1 Context and guidance

Collins, Brown, and Newman state in their article about cognitive apprenticeship (Collins, Brown, and Newman, 1989, p. 480) that the key goal in the design of guidance should be to help learners "acquire and integrate cognitive and metacognitive strategies for using, managing, and discovering knowledge". As core "teaching methods" in cognitive apprenticeship they see modeling, coaching, and scaffolding, and as supplementary methods articulation, reflection, and exploration. According to them, **modeling** means observing and building conceptual models of the processes which an expert is carrying out to accomplish a task. **Coaching** they define as observing the learners "while they carry out a task and offering hints, scaffolding, feedback, modeling, reminders, and new tasks aimed at bringing their performance closer to expert performance" (Collins, Brown, and Newman, 1989, p. 481). **Scaffolding** is the support for a specific task that the learners get at first and which is gradually faded away when their skills develop. The idea is to keep the learner at the appropriate level of difficulty all the time. **Articulation** is defined as "any method of getting students to articulate their knowledge, reasoning, or problem-solving processes in a domain" (Collins, Brown, and Newman, 1989, p. 482). It is close to Nonaka's and Takeuchi's (1995) definition of externalization, i.e. the knowledge conversion from tacit to explicit knowledge. **Reflection** makes it possible to compare one's own processes with an expert's ways to operate. Guidance can help in this by giving techniques for reproducing performances for

comparison (Collins, Brown, & Newman, 1989). **Exploration**, according to Collins, Brown, and Newman, means setting general goals for learners and encouraging them to focus on the subgoals they are interested in.

All the methods presented above utilize context. However, the whole context may be too complicated for the learners at the beginning, and therefore Collins, Brown, and Newman (1989) suggest three dimensions which can help in sequencing the learning activities in a suitable way. First, complexity should be increased gradually. It can be done by controlling task complexity and providing scaffolding. Secondly, diversity should be increased gradually so that the variety of strategies and skills needed in the task widens gradually. And thirdly, the learners should be given an opportunity to see the entire picture before going into smaller pieces of that entity.

As mentioned in Chapter 4.2, problem-based learning offers a "lower level" context. There is a great deal of material how problem-based learning should be guided (e.g. Boud & Feletti, 1997, Wilkerson, 1995, Schmidt & Moust, 1995). Being a contextual (even if not at the highest level) and collaborative learning process this material is especially interesting. The process starts when the groups of learners (often 8-12) get the starting point or description of the situation. They usually elect a chairman and sometimes also a secretary. After that they proceed e.g. as follows (Boud & Feletti, 1997):

- any unclear terms and concepts in the description are discussed and clarified
- one or several problems in the case description are defined and it is decided which phenomena require clarifying or finding of root causes
- the problem is structured into sub-areas and possible solutions and work hypotheses are thought of
- hypotheses and proposals for declaration are discussed and organized
- learning goals are defined
- plan for acquiring the knowledge needed is made and work is divided
- the group meets to evaluate the acquired knowledge and solves the problem.

Barrows (1988), one of the early developers of problem-based learning, states that to facilitate learner independence and foster learners' critical thinking and self-directed learning, the learners should be guided at the metacognitive level. "The oral statements and challenges he [the guiding person] makes should be those he would make to himself when deliberating over such a problem or situation as the one his students are working with. His questions will give them an awareness of what questions they should be asking themselves as they tackle the problem and an appreciation of what they will need to learn." (Barrows, 1988, p. 4).

Wilkerson (1995) found that tutors guiding problem-based learning were seen by first year medical students as the most helpful when providing the following help (Wilkerson, 1995, p. 307):

- encouraging critical appraisal of information
- questioning and probing of the reasoning process
- balancing of basic science and clinical discussions

The best rated tutors were also able to balance student-directedness with guidance and share professional expertise without lecturing. These tutors were

praised for allowing learners to develop and explore ideas through learner-to-learner discussion. They were said to be able "to judge the best moment to intervene in the students' exchanges to stop digression, refocus, highlight critical points, synthesize perspectives, or summarize" (Wilkerson, 1995, p. 308). Awareness of interpersonal dynamics in the group and skills in managing conflict are evidently needed. It was seen important that the tutors did not take control of the agenda away from the students. Highly rated tutors contributed to both the content and the process but without interfering too much. They were able to create a pleasant and productive environment for learning. Effective tutors, according to the learners, also stimulated the critical evaluation of ideas by asking probing questions, challenging fuzzy thinking, and encouraging working with hypotheses. (Wilkerson, 1995).

Schmidt and Moust (1995) emphasize three distinct qualities for effective tutoring in problem-based learning: the possession of a suitable knowledge base in the area under study, a willingness to become involved with students in an authentic way, and the skill to express oneself in a language understood by learners. These qualities consist of both personal qualities of tutors and their subject-matter knowledge.

In the community of practice, learning is self-directive and occurs through participation and engagement in a common practice (Wenger, 1998). It offers an excellent environment for modeling, articulation, and reflection mentioned above. No special guiding activity exists although different kind of help is given, as in any community striving towards shared goals. In the light of Bereiter's theory on knowledge building through working with abstract artifacts (e.g. Bereiter, 1997), it is beneficial to increase the level of abstraction. If this can be supported, it probably makes the application of knowledge easier in other contexts.

4.6.2 Collaboration and guidance

In Chapter 4.3 several issues related to group performance were presented. The most central ones were communication, commitment, conflicts, and decision-making. **Communication** appeared to be supported in several ways: through a democratic or facilitative leadership style, through task-oriented cohesion, i.e. focusing upon the task, through mutual trust, and through a small enough size of the group. **Commitment** comes with task-oriented cohesion and trust, and is supported by consensus decisions. An important precondition is that the goal has value for the participants and they feel it is possible to achieve it (self-efficacy). **Conflicts** (more specifically cognitive conflicts) turn the diversity of participants into creative power, if handled constructively. A precondition is that the participants are not too much alike. Constructive handling is supported by trust, which is a precondition for participants to present alternative viewpoints. **Decision-making** needs cognitive conflicts assuming that they are handled constructively. Consensus decisions should be preferred, time allowing. This has a considerable influence on commitment, especially in important decisions. The

central parts of the complicated dynamics of group performance according to the literature referred to in Chapter 4.3 are outlined in Figure 13. Guidance should contribute to this kind of dynamic system.

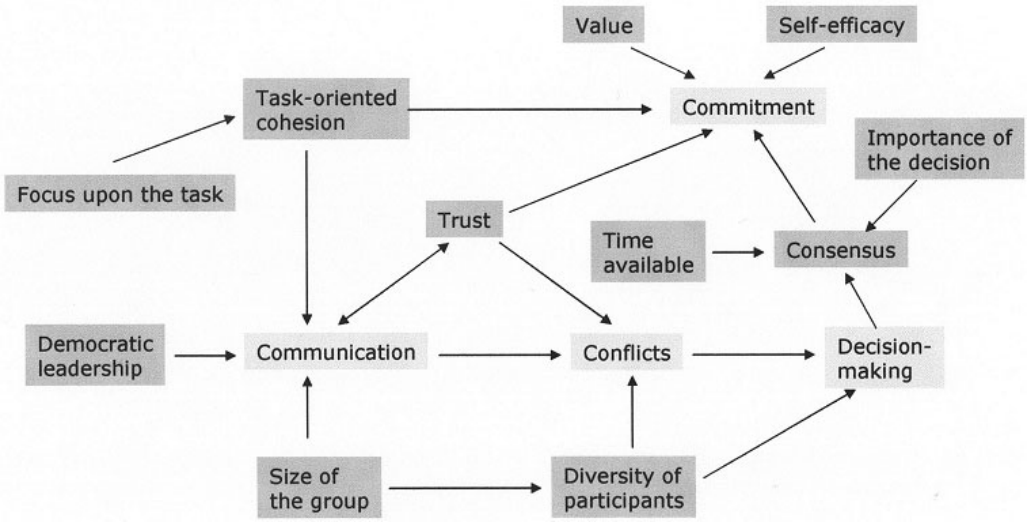

Figure 13 Summary of the main dynamics in a self-regulated group according to literature

Rees (2001) lists various characteristics of a facilitative team leader. Some of them appear to suit a facilitative learning guide as well. A facilitative team leader, among other things (Rees, 2001, p. 60-62):

- listens actively
- asks questions and listens to the whole answer
- actively seeks ideas and opinions from others
- solicits different viewpoints
- teaches and coaches others, without telling them what to do
- understands that different people are motivated by different things
- encourages team members to take responsibility for issues, problems, actions, and projects

Barrows (1988) also emphasizes the skill of managing interpersonal dynamics in the learning group. The guidance should help the learners to deal with interpersonal problems when they occur but not make them dependent on outsider help.

4.6.3 Individuals and guidance

The model of progressive problem-solving presented in Chapter 4.4 can be supported in many ways. Bereiter and Scardamalia (1993) write about schooling according to the knowledge-building community model, and as distinguishing characteristics from traditional schooling they mention nine points (Bereiter &

Scardamalia, 1993, p. 210-211). These points, slightly reformulated for an enterprise environment, are as follows:

- study of topics in depth rather than superficial coverage.
- focus on problems rather than on categories of knowledge.
- inquiry is driven by learners' questions. The learners are helped in formulating and reformulating questions.
- explaining is the major challenge. Learners are encouraged to produce their own theories and discuss them.
- focus is on progress towards collective goals of understanding and judgement rather than on individual learning and performance.
- learners work in small groups and each group has a different task related to the central topic and plans how to distribute work among its members.
- discourse is taken seriously. Learners are expected to respond to one another's work in helpful, supportive ways.
- what is to be learned or investigated is not curtailed by the knowledge of the guiding person.
- the guiding person participates actively in the learning process and leads it by virtue of being a more expert learner.

These characteristics are very well in line with the ideas of guidance presented in Chapters 4.6.1 and 4.6.2. The way the group works together is somewhere between collaboration and cooperation, using the definitions of Chapter 4.3. Much emphasis is on individual development, but collective goals exist as well.

In Chapter 4.4 it was stated, referring to Sandberg (2000), that workers' conception of their work is the most fundamental guiding principle that facilitates the development of competence at work. For guidance this means, according to Sandberg, that development activities like classroom teaching, apprenticeship, on-the-job training, job rotation, etc., should "be designed and conducted in a way that actively promotes changes in workers' conceptions of their work" (Sandberg, 2000, p. 22). According to him, the basis of development should be the workers' present conception of the work. He suggests organizing particular encounters between workers and their work as developmental triggers. The idea is to present challenges in the form of a work problem to stimulate workers to reflect on their present conceptions. The encounters, according to him, should be organized in a way that when workers begin to realize the limitations of their present conceptions, the desired conception is revealed as an alternative.

Motivational factors can be taken into account in guidance especially when setting goals and when commenting on attributions for success and failure. Motivational factors are closely related to learning orientations as well. As stated in the previous chapter, an important precondition for commitment is that the goal has value for the participants and they believe in being able to achieve it (self-efficacy). In guidance this means that the learners should influence the goals, and attributions should be guided, if possible. The latter because negative attributions can affect future tasks harmfully. They may lead to bad motivation or even learned helplessness, when one gives up because of not believing in the meaningfulness of his/her own actions (Seligman, 1992). Attributions can be guided e.g. by reframing, by changing the frame, in which a person perceives events, in order to change the meaning (Bandler & Grinder, 1982).

Knowledge of different learning styles and the strategies, models, and orientations behind them is especially useful in reflection. There are e.g. already several kinds of tests which can be used as reflective tools to support guiding towards more effective learning strategies. Changing a learning style, however, may need a long time. The research by Vermunt (1998) and Hattie, Biggs, and Purdie (1996) supports the view that when guiding learning of content the learners should at the same time be guided in self-regulation. It also appears beneficial to influence the mental learning models of learners in the direction of a knowledge constructing view.

Bokeno and Gantt (2000) emphasize dialogue in a mentoring practice. They see dialogue "as a collaborative, mutually constructive, critically reflective, participatory and emergent engagement of relationships among self, other, and world." (Bokeno & Gantt, 2000, p. 250). They state that the role of mentor is to construct organizational reality with the learner rather than reflecting to or interpreting for the learner. Dialogical mentoring needs, according to Bokeno and Gantt, contradiction and difference, openness, and equity of voice.

There are several kinds of other tools which can be utilized in guidance. Nonaka and Takeuchi state three important functions of metaphors: Firstly, metaphor is a way of perceiving or intuitively understanding one thing by imagining another thing symbolically and in this way a good tool for abductive reasoning, for creating radical concepts. Secondly, metaphors create new ways of experiencing reality and can be used to reconcile discrepancies in meaning. Thirdly, by using metaphors it is possible to create a network of new concepts. "… we can continuously relate concepts that are far apart in our mind, even relate abstract concepts to concrete ones. This creative cognitive process continues as we think of the similarities among concepts and feel an imbalance, inconsistency, or contradiction in their associations, thus often leading to the discovery of new meaning or even to the formation of a new paradigm." (Nonaka & Takeuchi, 1995, p. 67) After the metaphor, analogy is used to harmonize contradictions and to create concepts by rational thinking. After that the concepts can be modeled expressing them in systematic language and coherent logic.

Team roles (e.g. Belbin, 1995) are useful conceptual tools in guidance of group dynamics and in understanding individual differences. Metaprograms used in Neuro-Linguistic Programming (NLP) can also be useful in that. Metaprograms are individual perceptual filters which are used to determine what information gets through (O'Connor & Seymour, 1990). Observing these filters helps understand individual behavior better. An example of a perceptual filter is that some people notice similarities while others notice differences more easily.

4.6.4 Organization and guidance

What is guidance in the "hypertext organization" presented in Chapter 4.5? As stated at the beginning of Chapter 4.6, guidance is a collaborative process where

also top management, human resource development professionals, middle management, and superiors of the learners should participate. All of them have a special viewpoint valuable in the design of guidance and learning. Top management is needed in defining the larger context, human resource development professionals understand the possibilities and ways to achieve the competencies needed to implement different strategies, middle management have a realistic view of the situation in the "frontline", where the real implementation of different strategies happens, and superiors of the learners greatly affect the conditions where it is possible for the learners to apply their new knowledge and skills. Collaboration between these interest groups is therefore essential.

Nonaka and Takeuchi (1995) write about a "knowledge creating crew" referring to all the individuals engaged in knowledge creation within the company. This crew utilizes the "hypertext organization" and consists of "knowledge practitioners", "knowledge engineers", and "knowledge officers". Knowledge practitioners are front-line employees and line managers, knowledge engineers are middle managers, and knowledge officers are top managers (Nonaka & Takeuchi, 1995, p. 151). Knowledge practitioners, who are responsible for accumulating and generating tacit and explicit knowledge, are divided into "knowledge operators", who especially interface with tacit knowledge, and "knowledge specialists", who interface mainly with explicit knowledge. Knowledge engineers, according to Nonaka and Takeuchi, are responsible for facilitating the knowledge conversion while knowledge officers manage the organizational knowledge creation process at corporate level.

Knowledge practitioners are described by Nonaka and Takeuchi (1995) as embodiment of knowledge because they accumulate, generate, and update both tacit and explicit knowledge. Working usually in direct contact with the outside world they have access to the latest information on developments in different areas. The quality of their knowledge is determined by the quality of their experiences in the front-line, and therefore they should be given tasks that are as challenging and exploratory as possible. (Nonaka & Takeuchi, 1995)

Knowledge engineers, according to Nonaka and Takeuchi (1995), take the lead in converting knowledge, especially from tacit images and perspectives into explicit concepts. Their role is to facilitate a knowledge creation spiral across the different knowledge conversion modes and ensure that different organizational levels are involved in the process.

Knowledge officers' tasks Nonaka and Takeuchi define as giving a direction for a company's knowledge creating activities. They see three parts in it: articulating grand concepts on what the company ought to be, establishing a knowledge vision, and setting the standards for justifying the value of the knowledge being created (Nonaka & Takeuchi, 1995, p. 156).

What additional roles are then needed when there are communities of practice also? In communities of practice Wenger, McDermott, and Snyder (2002) see one critical role: community coordinator. According to them, the community

coordinator is a member in the community who helps the community focus on its domain, maintain relationship, and develop its practice (Wenger, McDermott & Snyder, 2002, p. 80). They see that the institutional organization should fund the work through a dedicated budget which covers from 20 to 50 % of the work time. As key functions of the coordinator they define:

- identifying important issues in the domain
- planning and facilitating community events
- informally linking community members, crossing boundaries, and brokering knowledge assets
- fostering the development of community members
- managing the boundary between the community and the formal organization
- helping build the practice
- assessing the health of the community and evaluating its contribution to members and the organization

Wenger et al. (2002) also state that the leading expert may not be the best person to act as coordinator because the primary role is to link people rather than give answers.

An important role in communities of practice is also broker who can introduce elements from one practice into another (Wenger, 1998, p. 105). Brokers are able to make new connections across communities of practice, coordinate operations, and open new possibilities for meaning. The job involves processes of translation, coordination, and alignment between perspectives. (Wenger, 1998, p. 109). Brokers should keep themselves as peripheral members in the communities to be able to sustain their multimembership.

4.6.5 Creativity, innovation, and guidance

According to Bereiter and Scardamalia (1993) creative expertise develops in the same way as any expertise, i.e. through progressive problem-solving (see Chapter 4.4). The distinction is that creative experts take bigger risks. They gradually develop knowledge of promisingness (see Chapter 4.2) that increases their likelihood of success. "Creative experts are experts at taking successful risks in their domains." (Breiter & Scardamalia, 1993, p. 125). Their connectionist viewpoint enables them to base the idea of promisingness on unsystematically combined, variable knowledge. Having repeatedly judged whether something leads to a desired outcome, experts gradually acquire a repertoire of indicators that increases their ability to predict (p. 139). As conventional methods to help enhance creativity Bereiter and Scardamalia see e.g. telling a person in a dead-end situation to try something else; encouraging them not to critisize their own ideas and providing a secure environment where they are not afraid to be different and to take risks (p. 146). Bereiter and Scardamalia regard these as doing good, but emphasize the importance of gaining knowledge of promisingness through experience of solving problems within a particular domain, so that one comes to recognize the signs of promising and unpromising paths within that domain (p. 147). The process remains the same process of developing expertise through progressive problem-

solving but the goals are creative. There are two simple requirements for developing creative expertise (p. 147): goals must be creative and one must occasionally succeed. The main task of guidance towards creativity, according to Bereiter and Scardamalia, is that the guides show the starting points of promising paths. They do this by using knowledge acquired through their own creative efforts.

As already discussed in Chapter 4.5, fluctuation and creative chaos is one of the five organizational conditions for promoting the knowledge spiral of Nonaka and Takeuchi (1995). Some fluctuation is needed to question the routines, habits, and mental models so that new knowledge can be created. The chaos can also be generated intentionally. According to Nonaka and Takeuchi, it "increases the tension within the organization and focuses the attention of organizational members on defining the problem and resolving the crisis situation." (Nonaka & Takeuchi, 1995, p. 79). They emphasize that creative chaos is beneficial only if the organizational members have the ability to reflect upon their actions.

Communities of practice offer a good platform for creativity. They also fulfill the five organizational conditions of Nonaka and Takeuchi by definition, but on a smaller scale. The continuous negotiation of meaning by participation and reification bring both order and chaos to the process. Wenger says that the ability to include both structure and dynamism, to walk the line between chaos and order, is a characteristic that makes communities of practice a likely locus of creativity (Wenger, 1998, p. 289).

Boer and During (2001) have studied different kinds of innovations and found interesting similarities and differences between product, process, and organizational innovations. In all three types of innovation the main focus was on problem-solving, while both organizational adaptation and internal diffusion were usually neglected. Most companies did not take enough time to complete the problem-solving cycle. They usually stopped the cycle at the implementation of the solution and did not solve the problems which came up after that. The most important difference was that organizational innovations appeared to require much more internal diffusion than the other innovation types. Product innovation was the easiest one in this sense and process innovation was somewhere in between. As managerial implications of their research Boer and During state among other things the following points (Boer & During, 2001, p. 104):

- innovations require top management commitment and involvement
- successful innovation requires a careful balance between top-down strategic drive and bottom-up emergent creativity (similar to the idea of middle-up-down model by Nonaka and Takeuchi (1995))
- innovations require, in addition to technical skills, considerable social and managerial skills, a favorable attitude, and occasionally also some formal or informal power.
- the HRM (human resource management) function tends to focus too much on technical knowledge and skills, rather than on selecting people on the basis of their potential as role players (the message of Belbin (1993) as well).

5 Model and its consistency

The purpose of this chapter is to present a model for contextual collaborative learning. The exploratory findings and grounded theories of Chapter 3 in addition to the theories of Chapter 4 have been combined to form a coherent learning model for enterprise environments. The main idea is to utilize organization level, organizational unit level, and expertise community level tasks to form the context for learning. Having these three levels together in close connection ensures a sufficient number of boundary objects and brokers between different communities to make it possible to develop the organization as one entity. The main question in this chapter is: how could Case 2 be improved and developed as a model where also theories and Case 1 findings are utilized. It is also important to check the consistency of the model with the original research data because the model is not only based on the grounded theories derived from the data.

5.1 Model for contextual collaborative learning in an enterprise environment

5.1.1 Integration of contexts

Tasks at several organizational levels must exist in contextual learning. Understanding issues of the organizational entity requires upper organizational level tasks, understanding issues at unit level requires unit level tasks, and understanding issues of special expertise requires problem-solving in specific areas. To be really contextual in its full meaning (see Chapter 4.2) the tasks must be useful and benefit the organizational level in question.

The context, where the acquired skills and know-how were meant to be used, was clearly present in both cases of Chapter 3. In Case 1 the context was at expert community, tool user community level. The organizational unit level context was weak because the participants operated mainly in tool designers' conditions and e.g. their superiors could not much affect the content. At the beginning the problems were easier and always connected to situations similar to the real world. Shared orientation and experiences from the problems supported the formation of context. The process had similar features with problem-based learning (briefly presented in Chapters 4.2 and 4.6.1.) even if it was not as collaborative as problem-based learning usually is (Boud & Feletti, 1997). In Case 2 the context was the reality itself, the present situation and the real problems the management had. This was clearly an upper organizational level context. The management presented the situation and then it was elaborated in the strategic projects with help of the guide and the mentors.

Next, as a first step towards a model of contextual and collaborative learning, a general framework is built taking the different contexts into account.

A suitable starting point is the "double-knit" organization already briefly described in Chapter 4.5. It appears to help in the problem of how to utilize new knowledge in the organization. As Wenger, McDermott, and Snyder (2002) point out, the idea is the cooperation between formal goal oriented units and informal practice developing units. In formal units people work in teams and work groups for short periods of time. The informal community of practice is more stable and consists of experts who are interested in the domain of the community and who can be from any organizational unit. The double-knit enables the organizational unit and the community of practice to support each other, thus ensuring that relevant new knowledge is applied in the organization. Double-knit, however, does not guarantee understanding of the organizational entity because the upper organizational level context is missing. Knowledge and skills are developed in a community of practice and applied in formal teams and work groups, but usually the focus covers organizational level issues only partly, if even that much.

In this work it is proposed that also upper level organizational context be added to the double-knit model to form a "triple-knit" contextual framework. The purpose has similarities with the middle-up-down management model of Nonaka and Takeuchi, presented in Chapter 4.5, but instead of the mediating actions of middle managers, anybody, even front-line workers, can be directly involved in issues concerning the whole organization. This can be done by giving them strategic projects as in Case 2 in Chapter 3. Strategic projects are good for two reasons: They form a useful context at the upper organizational level and they reveal needs for new knowledge and skills. The new model also has many similarities with the hypertext organization of Nonaka and Takeuchi (1995) and especially with the community-based hypertext organization of Tuomi (1999). However, it differs from them by also including the strategic context.

There certainly are many ways to form a triple-knit contextual framework but, based on the exploration of Chapter 3 and theory of Chapter 4, the following procedure appears especially attractive: Definition of the learning tasks should be connected to the strategy process[25] of the organization. This process produces information in the most important areas where new knowledge and skills are needed. The information is then used to form general questions or problems which should be solved. If there already are communities of practice in relevant areas, these can be used to improve the questions or problems. Questions or problems should not, however, be made too specific. Communities of practice can also participate in finding suitable persons to join the community and help in elaborating the questions. If no communities exist, efforts to find potential members of communities are made and they are then encouraged to build a new community of practice. The idea is to establish a small group of 3-8 persons to solve a real organization level problem, and, at the same time, let the

[25] Strategy process is defined here as the process through which the strategy of the organization is developed. The way it is implemented varies very much. It can be a continuous process or a small refinement once a year, it may involve the whole organization or only one person.

group participate in a community of practice which can support their activity. If a strong and relevant community of practice already exists, the group can operate there as peripherial members concentrating on their own task and, at the same time, learning by engaging in the joint effort of the community. The precondition for this is that the community finds the task interesting and accepts the participants as legitimate members of the community. Therefore, if a suitable community is found, it should participate both in the improvement of the initial questions or problems of the strategy process and in the selection of new participants. In this way there will be groups who firstly have tasks based on the strategy and expert evaluations of the needs for new knowledge and skills, and which secondly are accepted by communities of practice. The groups and networking between them can be supported by arranging workshops around some general interesting issues with well-known experts participating in them. The participants of relevant communities of practice should also be invited to these workshops; it gives older generations opportunities to get ideas and update their knowledge base as well.

This is, however, not enough. The learners have an upper organizational level context and an expertise development context, but not automatically a fruitful connection to their organizational units. This third context, an organizational unit, is somewhat more problematic because of the shorter-term and rapidly changing goals. Organizational units are, however, important places, where new knowledge and skills are converted into concrete achievements and in that way into positive cash flow. Organizational units are also often home units of the

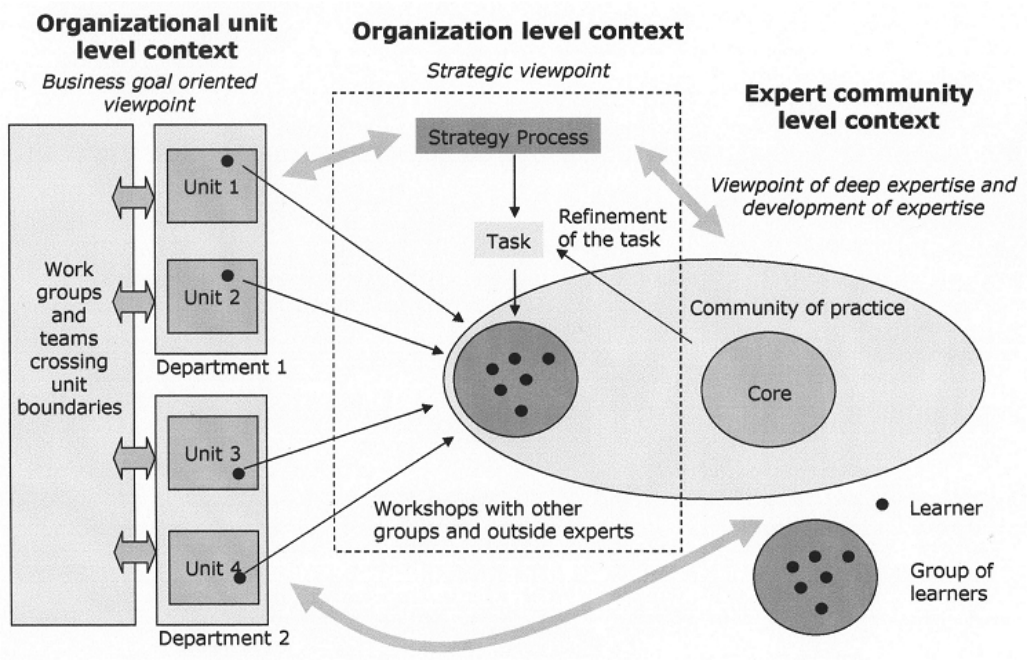

Figure 14 Triple-knit contextual framework connecting three different contexts

learners. The work is usually done in work groups and teams, and cooperation is often beyond the unit boundaries. Case 2 clearly showed that the participants from organizational units that could not see any benefit from the strategic projects, could not apply their new knowledge and skills achieved if they stayed in their home units. Therefore, it must be ensured that persons selected for a strategic project, work or will be moved to work in an organizational unit which understands the value of and can benefit from the new knowledge and skills. Only then can a fruitful unit level context be formed, viewpoints of the units taken into account, and the triple-knit framework work. The basic idea of the contextual framework is described in Figure 14.

5.1.2 Enabling of collaboration

In the contextual framework presented above the central unit was a group of learners from different organizational units. The case descriptions in Chapter 3 and theories in Chapter 4.3 gave good reasons for this showing several benefits of collaboration. The starting point in the cases of Chapter 3 was, however, not the best possible.

In Case 1 collaboration was made challenging by not selecting the participants carefully according to their experiences, knowledge, and skills, or favorite team roles. Probably thanks to good guides and small groups, however, the atmosphere was good and appeared to make collaboration possible. Especially the shared orientation at the beginning appeared to affect the atmosphere of collaboration positively. Despite the big differences in knowledge and skills, all the learners had some basic knowledge and experiences of the subject and they were interested in the new tools. Owing to the good atmosphere, experiences, and problems of the case exercises there was discussion. The tools formed a common framework, which helped collaboration.

In Case 2 collaboration was facilitated at the beginning by the good and motivating introduction made by management and the guide. Also the facilitator gave some advice. Otherwise the participants in the groups were on their own trying to understand each other. It was not an easy task because the participants represented different organizational units and had different learning styles. Usually after long discussions they got acquainted and started to trust each other better making it possible to discuss sensitive issues also. In the best case they understood how to utilize each others' special skills, working methods, and differences. In some cases the group was never able to collaborate as one unit and the work was done by one or two members individually. The members should clearly have been selected more carefully and/or more guidance in teamwork should have been given. The facilitator made some interventions (e.g. encouraging comments) to improve the atmosphere, and some activities and evening programs were arranged for the same purpose. One of the best interventions was very simple: leaving space in the program to exchange knowledge (e.g. during lunches, dinners, and evenings programs). The

atmosphere appeared to depend on the level of trust within the group and on the participants' sense of humor and social skills.

In the light of the theories summarized in Chapter 4.6.2, the secret of the success[26] in the cases was probably task-oriented cohesion, which improved both communication and commitment. When combining the grounded theories of the cases in Chapter 3 and theories of collaboration in Chapter 4, good collaboration appears to be facilitated by

- **selecting interesting and relevant problems** to be solved and defining them loosely enough so that the group has space to formulate them from their viewpoint (Case 2). This helps the group to focus on the task and in this way increase task-oriented cohesion. Experiencing the goal as valuable, trusting each other, and having task-oriented cohesion all contribute positively to commitment (Chapter 4.6.2). As already mentioned above, the selection of problems comes from the strategy process.
- **taking care of the minimum knowledge and skills** needed in the domain to be able to contribute (Case 1) in addition to knowledge and skills needed in conflict handling and decision-making (Case 2, Chapter 4.3). This issue is discussed in more detail in Chapter 5.1.3.
- **allowing free working pace** (Case 1) or democratic leadership (Chapter 4.3) which are close to each other and close to the idea of self-direction in learning (Chapter 4.6.1) or self-managed work teams (Yeatts & Hyten, 1998). This appears to create questions and cause communication, which also creates trust (Case 2). Deadlines are useful and needed (Case 2), but the group should decide how to meet them.
- **taking care of sufficient diversity of participant roles** in the group. This should ensure a sufficient number of conflicts to get good quality decisions (Chapter 4.3). The precondition is that participants have the knowledge and experience of handling of conflicts and of decision-making (Case 2). It is also important that the participants understand group dynamics and the power of diversity (Case 2, Chapter 4.3). Different backgrounds enrich group work (Case 1, Case 2).
- **keeping the group size small enough.** The best size for high-level communication is, according to the theory in Chapter 4.3, about six to eight members. The group size of five to six persons appeared to work well in Case 2.

The issues presented above are summarized in Figure 15.

In Case 2, where the groups worked together for several months, coaching of collaboration was too weak (Chapter 3.2). The guide and mentors, who saw how the groups really worked, were only interested in the substance. This is understandable because guiding content as such was already demanding. No ready answers existed; the tasks were real problems. The facilitator tried to help in collaborative issues, but he did not see very many actual situations where the groups worked with the strategic projects. It might also have been disturbing if the facilitator had participated in every group meeting. However, at the beginning someone should visit the groups and observe them only from the

[26] Despite some unfavourable preconditions both cases were evaluated as successful.

perspective of collaboration. In the ideal case the participants already have teamwork experience, knowledge, and skills achieved e.g. through participation in problem-based learning processes.

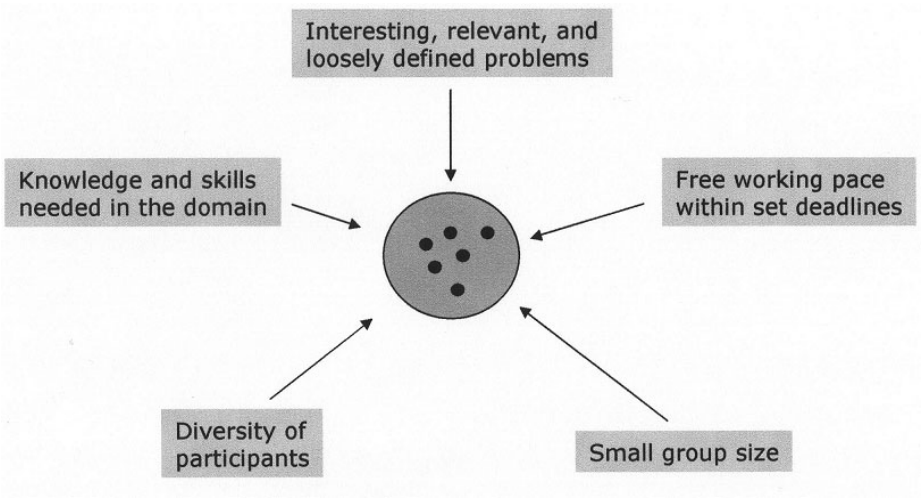

Figure 15 Facilitating factors of good collaboration in a group

In addition to collaboration within the group the community of practice, which the whole group participates in, must be taken into account (Figure 14). As many members of the group as possible should be able to participate in the community as legitimate members. According to theories in Chapter 4, this calls for the following issues:

- the group members are interested in the domain of the community and want to engage in its enterprise, actions and negotiations of meanings
- the task of the group interests the community
- the community accepts the group members as legitimate participants

These issues are summarized in Figure 16.

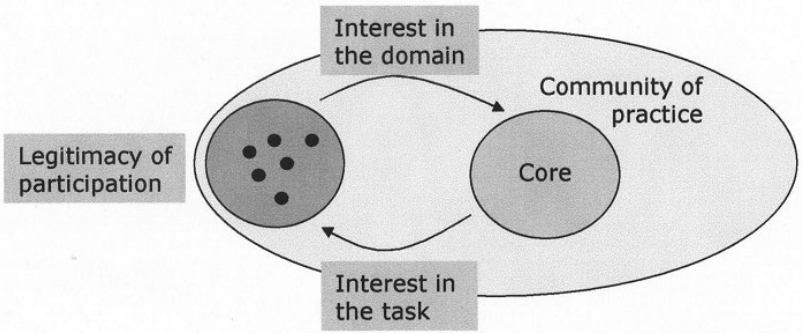

Figure 16 Facilitating factors of collaboration between the group and the community of practice

5.1.3 Participants

In both cases of Chapter 3 the individuals had to have some work experience before attending the courses. In addition to it they also needed the acceptance and recommendation of their superiors. In Case 2 the superiors did not know the subjects of the strategic projects beforehand. The participants also had to fit in the quota reserved for their larger organizational unit. No knowledge or skills were tested prior to the courses. In Case 2 the groups were formed so that the participants as much as possible represented different organizational units and had different learning styles. In the analysis of Case 2 the most needed skills appeared to be team working skills, especially how to build a good team.

As mentioned in the previous chapter, one of the prerequisites for collaboration in the contextual framework presented in Chapter 5.1.2 was that the participants had at least minimum knowledge and skills, of both content and process, needed in the domain. In accordance with the theories in Chapter 4.4, some other conditions are beneficial for individual learning as well:

- a second order environment where the conditions change providing continuous challenges
- possibility to progress through learner's questions and possibility for the learners to elaborate the issues they felt important
- challenges in the form of a work problem to stimulate the learners to reflect on their present conception of work
- possibility to contribute to or choose the learning task
- possibility for the learners to get positive experiences of their capabilities when performing tasks (e.g. through scaffolding and gradually fading with the improving skills)
- possibility for learners to understand their own metacognitive styles of learning through some reflective tools

To create the conditions it appears to be possible to combine the traditional coaching of a group, and learning through participation in a community of practice. A second order environment is difficult to arrange by using a traditional approach, but a community of practice is already a second order environment if it continuously develops its practice. Possibility to progress through learners' questions and possibility to elaborate important issues is quite natural in a community of practice but can also be implemented in a traditional learning group, if guided well. Stimulating learners to reflect their work conception occurs naturally in communities of practice where meanings are continuously negotiated. If the aim is to reveal special conceptions as results of particular encounters as described in Chapter 4.6.3, the traditional approach is a more controlled way of doing it. Both approaches offer the possibility to contribute to or choose the learning task. However, in communities of practice they are usually not called learning tasks. Learning occurs as a result of participation in the practice and newcomers are given easier and more comprehensive tasks, which they are able to contribute to within certain limits. In this way communities of practice also offer, through a sort of scaffolding, the possibility to

get positive experiences of one's capabilities when performing a task. This can be arranged in the traditional approach as well, but the experiences may not be as strong compared to actual situations in a shared practice. Finally, the possibility for the learners to understand their metacognitive styles of learning may be easier to arrange in the more controlled traditional approach.

If a participant does not have the minimum knowledge and skills needed in the domain, problem-based learning using predefined cases is a good method to improve them for the following reasons: first, as a contextual method wanted viewpoints can be given (Case 1, Case 2), secondly, as a collaborative method collaboration can be practiced, especially conflict resolving and decision-making, and thirdly, with its predefined cases different levels of scaffolding (Chapter 4.6.1) are rather easy to implement (Case 1). Problem-based learning with predefined cases also offers good opportunities for guides to concentrate on group dynamics and selection of participants because possible solutions and typical mistakes are already known to them.

Requiring some work experience in an organizational unit before having strategic level tasks, as in Case 2, appears to be wise because a well developed unit level understanding is beneficial when constructing the big picture as e.g. Nonaka and Takeuchi (1995) pointed out in their middle-up-down model. In the first phase when experience is gathered, problem-based learning is a good method to deepen the knowledge and skills of both process and content. In this phase it is important to develop especially dialogical, problem-solving and decision making skills together with the domain knowledge. It is also useful, in accordance with the theories of Chapter 4.3, to utilize diversity as much as possible already in this phase. In the selection of participants for any groups, attention should be paid to compatible team roles. The level of knowledge is also an important factor

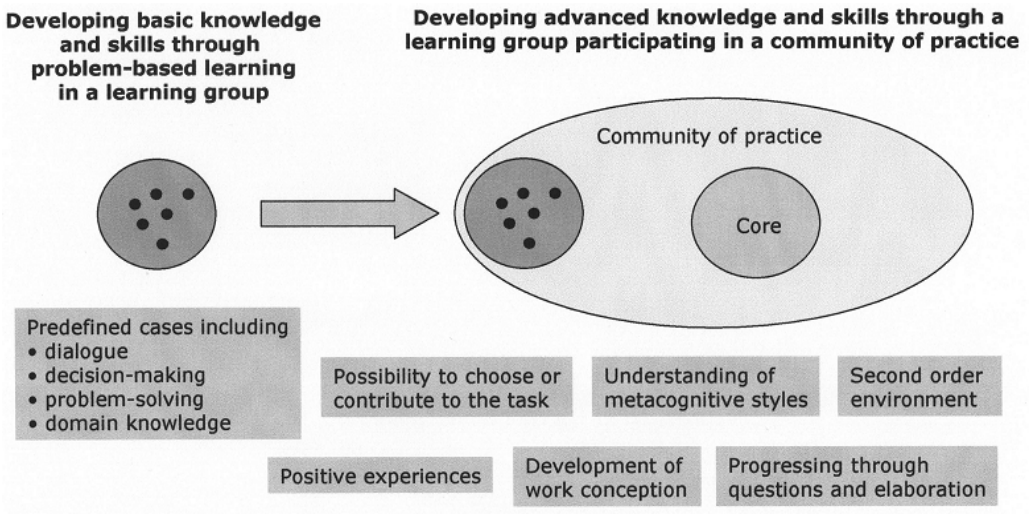

Figure 17 Facilitating factors of individual learning

which should be taken into account. However, insufficient knowledge and skills can more easily be worked on than an incompatible team role.

The issues facilitating individual learning are summarized in Figure 17.

5.1.4 Guidance in different contexts

In the different contexts presented in Chapter 5.1.1 and in Figure 14 the guidance given should be different. In the unit level context the superior of the learner is the key person. Case 2 clearly revealed the need that learners and superiors have common goals. In addition to the important positive attitude and mental support from the superior, a common goal appeared to improve opportunities to exchange knowledge between the learner and the working community, openness of information in the unit, and easing of time pressure. It should also be remembered that the superiors do not necessarily have knowledge and enough skills to be able to support the learners. Therefore the superiors of the learners should be guided as well, and it should also be ensured that they have opportunities to develop themselves all the time.

The role of knowledge engineer, presented in Chapter 4.6.4, may suit the guiding superior. As described by Nonaka and Takeuchi (1995), knowledge engineers facilitate the knowledge conversions (see Chapter 4.2) and especially take the lead in converting tacit images and perspectives into explicit concepts. The qualifications Nonaka and Takeuchi (1995, p. 156) see important for the knowledge engineers, are communication skills to encourage dialogue among team members, proficiency at employing metaphors in order to help others generate and articulate imagination, and skills at coming up with hypotheses in order to create new concepts. These qualifications may sound rather idealistic when thinking of the present pressures the superiors of especially front-line units have. However, if continuous renewal is wanted, the superiors should be able to facilitate the adaptation of new knowledge and skills in their unit. Having shared goals and open communication between the superior and an individual learner, and also within the whole unit, appear to be key factors in it. Superiors can also use their knowledge of promisingness, as presented in Chapter 4.6.5, to show starting points of promising paths to the learner. The dynamics presented in Figure 13 also apply to the unit level context. However, the number of consensus decisions is probably much smaller in the unit because of both time pressure and amount of routine work.

In the organization level context guidance is divided between several persons, as Case 2 showed. In addition to the guide the central roles in the guidance of the strategic projects were mentors (experts supporting groups), management (introducers of the tasks and receivers of the results), principal (representative of the management), and facilitator (supporting learning and the course in general). Human Resource Developers mainly operated in the background and did not give any direct guidance. The guide was an outsider who worked in collaboration with people from the organization in the above-mentioned roles.

The guide took care of the observed seven phases described in Figure 6: practicing the projects, giving information and tools, letting the group members get to know each other and the subject, increasing the amount of information, supporting convergence, supporting the formulation of the presentations, and supporting the presentations. Next these seven phases of guidance are discussed from the point of view how useful they would be as parts of the model introduced in this chapter, and how they could, according to theories, be improved.

The first part of the guidance in Case 2 was to ensure the preconditions for successful guiding. The guide knew the subjects of the strategic projects in advance, and had a sufficient amount of knowledge, skills, and experience in the subject area. This enabled elaboration of the projects, e.g. by first finding one way to do them before the projects really started. In the light of the results of Wilkerson (1995) and Schmidt and Moust (1995) about tutoring, referred to in Chapter 4.6.1, profound knowledge of the subject area is a must. Especially questioning and probing of the reasoning process is impossible without expertise in the subject area. It should also be remembered that there are no proven correct answers because the tasks are important present problems of the management, brought up in the strategy process.

The second phase in Case 2 was to give information and tools (methodological and physical) to the groups so that the subjects were understood and the groups had at least some ideas about possible methods. The guiding work was divided so that different top managers introduced the problems to the participants, and the guide offered and introduced a tool set (different kinds of methods) which he thought would be useful. Management’s role clearly increased the value of the task and the guide probably contributed to the self-efficacy of the groups, which, according to the theory increases commitment, as indicated in Chapter 4.3 and Figure 13. The second phase of the procedure applied in Case 2 also appears to suit the model as such.

In the third phase of the guidance in Case 2, the participants got to know each other and the subject, after which team formation started. Here the facilitator supported the process by getting to know each participant, giving advice, following the development of team working skills in the workshops, having informal discussions with the participants, and taking care of the atmosphere. In accordance with the theory in Chapter 4.4, the facilitator's contribution would probably have been better if the training of study skills had been connected to content more. The facilitator should have participated in at least some of the first group meetings also outside the workshops to see how the real collaborative work was developing inside the group. The role of facilitator is definitely needed, if participants have little experience of group dynamics, as it was in Case 2. As already earlier stated, guiding the content is demanding and the guide is seldom capable of guiding both the content and group dynamic process. A good way to deal with this is to develop collaborative skills beforehand by using problem-based learning as presented in the previous chapter. Then collaborative skills are combined with useful content but, as predefined cases, the content is not so demanding and also allows the guidance of group dynamics more easily.

After the starting phases, in phase four of the guidance in Case 2, the amount of information was increased. By presenting many different viewpoints the guide created chaos on purpose. The mentors and different experts often unintentionally appeared to increase it just by telling about the subject area, thus gradually revealing the complexity of the area to the learners. This is probably the most fruitful time to arrange joint workshops with other groups having experts as introducers. The idea, presented in one interview, that an expert first tells about his/her views about the subject area in an interactive way, after which it is discussed from the viewpoint of the present situation in the company, appears attractive. In general, the incoherent state which was created during phase four appeared to foster questioning, idea generation. and self-organization. This view is also well present in literature, e.g. Nonaka and Takeuchi (1995), Wenger (1998), and Ståhle (1998). To let different experts tell about their theories and their differing views of the problem or situation at hand appeared to be a practical way to provoke creative chaos.

The fifth phase in the guidance of Case 2, where the basis for the project was created, supported hard work. Especially in this phase the mentors gave valuable help by giving their networks for use and helping the groups to get information which was not easily accessible. Combining the observations in Case 2 and theory in Chapter 4.6.5, the guide, as an expert of strategic issues, can be seen to have supported the group by showing starting points of promising paths. He used his knowledge of promisingness acquired by his own creative efforts. The qualities for effective tutoring in problem-based learning, presented in Chapter 4.6.1, are in line with Case 2 observations. As stated earlier, they are: the possession of a suitable knowledge base in the area under study, a willingness to become involved with students in an authentic way, and the skill to express oneself in a language understood by learners. Muukkonen, Lakkala, and Hakkarainen (2001) present a model called Progressive Inquiry, which can be applied to the learning group to systemize its working methods. The model is based on the progressive problem-solving of Bereiter and Scardamalia presented earlier, and its special benefit is that it encourages the group to start its work from elaborating ideas and conceptions instead of taking mainstream thinking as a starting point.

The structure for the project was supposed to be formulated in the fifth phase, and if not, the guide gave rather strong recommendations about it. In some cases, when the group appeared to be lost, his role changed from coach to strong instructor who clearly showed the direction. The method to increase instruction sometimes as far as dictation, if the group did not find a structure for the project, can be seen in at least two ways: firstly, the change in guidance is a clear sign to the group to work more efficiently, and that the deadline of the project must be met. In some cases it appeared to cause reflection in the group, which lead to better collaboration and a return to self-regulated work again, while in others it appeared to cause relief because they felt they were finally clearly being told what to do, and they gladly continued instructor-lead working. Secondly, the change in guidance is one way to ensure at least one solution to the problem on time. However, it may happen that the work is then done by the

guide rather than by the group. At its worst, the learners may lose their interest in the strategic project and only try to get it done with minimum work. In accordance with the theories of Chapter 4.3, dictation violates the important conditions of fruitful collaboration, especially communication, and, as described in Figure 13, this affects trust and ability to utilize diversity. However, some intervention is needed if the group continues the preparatory conversation endlessly. As an intervention, stronger instruction is positive in the way that it ensures taking care of those groups which happen to consist mainly of learners who are not self-directive. At the same time it also allows a return path for those groups which only need boosting. It is also important to note that the only outsiders working with the group are the guide and the mentor. These two persons get the deepest understanding of the results by participating in the practice and its negotiations of meanings, as described in Chapter 4.2. To achieve a better utilization of the results in the organization, more people should somehow participate in the process. That is the reason why the whole group is inside a community of practice in the model described in Figure 14.

Phase six in the guidance of Case 2 was called a refinement phase in Chapter 3.2. Here the guide supported the groups in the formulation of the presentations for the management. The main goal was to get the most essential issues out clearly and make the presentations understandable and interesting. As stated above, the results, even in a good presentation, cannot be fully understood without participating in the process of negotiation of meanings. The presentation is a reification which is most valuable for the group itself. Probably, a presentation is needed to inform top management about the solutions, but one should never assume that the management has some special ability to implant the best ideas into the organization. If the community participating in the group’s work from the beginning is larger than just the guide and the mentor, it creates better possibilities for utilization of the results. The mentor, as an expert in the domain, is probably already a core member in an informal community of practice operating in that area. Instead of just letting the group use his/her network the mentor should somehow get the group to participate in the practice of that part of the network which is closest to the group's task. Some ideas of how to do this are discussed in the next chapter.

The last phase of guiding in Case 2 was phase seven, which took place in the Evaluation workshop to which the top management was invited to hear the results. Here the guide supported the presentations in many ways, e.g. by introducing to the subject, by asking questions which clarified the essential points and by tying the different presentations to an interesting entity. He also briefly evaluated each presentation to the whole audience. Management had a prominent role in this phase because they discussed and evaluated the results, and, if they were satisfied, invited some groups to give additional presentations later. Too often, however, it appeared to be not well understood that the groups and their participants had much more than the plain final results to offer: they often had solutions, new ideas and ways of thinking, networks across the organization, and versatile competencies in both substance and teamwork. The final result and the presentation are the most tangible part, and yet only a small part of the entity. As already said, the guide and the mentor are the only

persons who, through participation, are able to more deeply understand the knowledge and skills developed in the group during the process. Therefore they, in particular, are the right persons to support and comment on the presentations and evaluate the groups, as the guide did. The situation is very delicate owing to the deep engagement, which most of the participants had in the process. This, and the outsiders' narrow view of the real results, should be remembered when e.g. the management gives evaluative comments. The role of the management is to facilitate that not only the tangible results but also all the new knowledge and skills achieved are utilized in the organization. Utilizing communities of practice helps in this task.

The principal, as a representative of management, participated in the most important events and gave valuable views and support to the process. From the management, the principal appeared to have the deepest understanding of the results, and he used it to create connections to the organization. The role of the principal is useful and recommendable, but not as crucial as the role of guide and mentor.

Guidance in the third context, in a community of practice (see Figure 14), occurs through the mutual engagement in a joint enterprise, as stated in the theory of Chapter 4.2. As Lave and Wenger (1991) state, learning in a community of

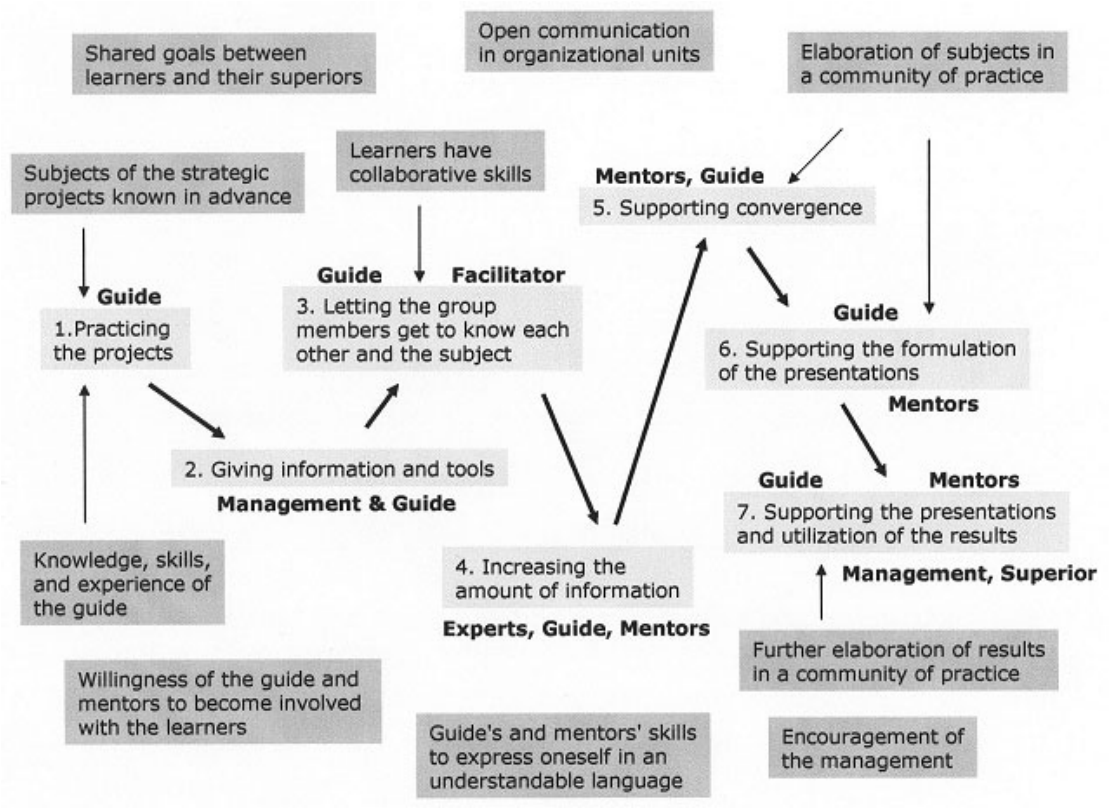

Figure 18 Guidance process of developing advanced knowledge and skills, its actors, and main facilitative factors of its results

practice can occur without formally organized apprenticeship. However, some facilitation is useful also in that context. In Chapter 4.6.4 the community coordinator was mentioned as the person who, among other things, fosters the development of community members. According to Wenger, McDermott, and Snyder (2002) he/she also identifies important issues, plans and facilitates events, and links community members crossing boundaries and brokering knowledge assets. The community coordinator is in a key position to guarantee legitimacy to the learning group as members of the community. If not a leading expert in the domain he/she is also able to arrange situations where new peripheral members can challenge old practices. New peripheral members can also, through observation, participation, and fruitful dialogues with the core members, learn to understand the reasons practices have developed into what they are. This way it is possible to engage more people than just the guide and mentor of the learning group in the strategic project, and the utilization of results starts before presenting the results to the management. Another positive feature is that the mentor is no more the only expert guiding the group in the domain. The whole community of practice can be seen to help in the guidance.

The mentor, with his/her expertise and wide network, would be a suitable person to act as a community coordinator, if there was no community of practice yet. Or if it exists, a community coordinator would be a suitable person to mentor a strategic project group in his/her domain. In this work it is proposed that mentors should be found from the community coordinators in the relevant areas.

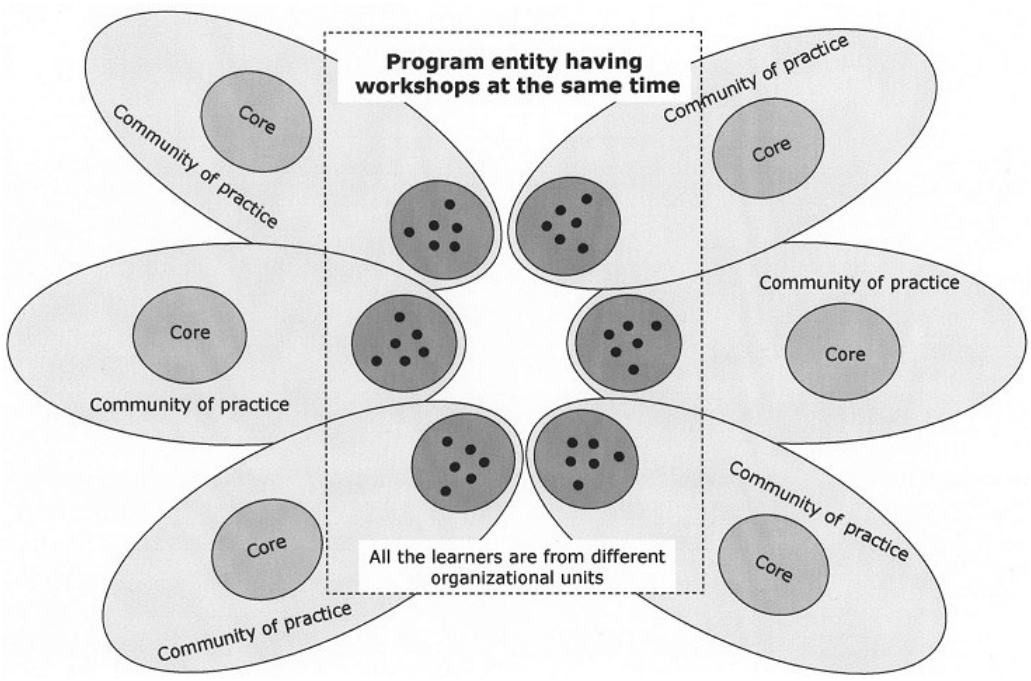

Figure 19 Program entity consisting of six learning groups

Irrespective of whether the communities are formal or informal, it should be relatively easy to find coordinator-like persons by interviewing a few recognized experts in the domain. It is then easy for them to name the most central persons in the network. The guidance process of the triple-knit model with its main roles and facilitative factors is outlined in Figure 18. The program entity consisting of six groups is described in Figure 19.

5.1.5 Managing the entity

Every organization is different and therefore only some central issues concerning the management of the entity consisting of the three contexts are dealt with here. Managing all the contexts at the same time is challenging but not impossible. It is a complex task needing seamless collaboration between management, experts in different domains, superiors of the organizational units, and human resource development (HRD) professionals. The HRD professionals are a natural choice as the glue which keeps the entity together and sees that everything works well. To be able to communicate with different interest groups they should, in addition to their knowledge of professional development, understand strategic issues of management as well as operations and pressures in the front line. Understanding calls for context, as stated in Chapter 4.2, and therefore deep enough understanding is hardly possible in a centralized HRD-unit. HRD-people should work in the operational units experiencing that world and participating in the enterprises of the units. At the same time they should form a community of practice where they can support each other and develop themselves.

Before applying demanding learning modes, basic knowledge and skills, especially collaborative skills, must be taken care of. According to Chapter 5.1.3 this can be done by applying problem-based learning. Special emphasis should be on dialogue, decision-making, and problem-solving skills, which are learned together with domain knowledge. During this initial phase also typical team roles of the participants should be mapped to make the formation of learning groups easier later. Managerial challenges at this stage may be to find guides who fulfill the criteria presented in Chapter 4.6.1 and who are also able to coach collaboration. If this is difficult, separate coaches for collaboration can be used but, as stated earlier, it is recommended that learning of these skills be connected to the learning of domain knowledge.

When there are several contexts, managerial challenges increase. At unit level the HRD should in every way ensure that the superior of the unit and the learner have shared goals. This need came out clearly in both cases. In addition it should be remembered that also the superior should be guided to understand the idea of several contexts and how he/she can benefit from that. If the superior cannot see any benefit, the learner is probably in the wrong unit and should change to a more suitable one.

At organizational level the first challenge is to build a connection to the strategy process. This is necessary to have continuous cooperation with people involved

in the process, to understand the most important development areas, and to get suitable subjects for strategic projects. After this existing communities of practice in these development areas should be mapped. As stated earlier, this can usually be done by interviewing some experts who work in the area or close to it. Mapping makes it possible to outline the expert network around the subject. Wenger, McDermott, and Snyder (2002) say that a social network analysis, made formally or informally, can be used to identify who is involved in the network and where the ties between people are strong (p. 72). If the network is found and it shares a concern, a set of problems, or a passion for the subject area, and it deepens its knowledge and expertise in this area, then it fulfills the definition of a community of practice (Wenger, McDermott & Snyder, 2002, p. 4). The person, who appears to sustain the network or is clearly the community coordinator, is probably the best candidate for mentoring the learning group. Through this person it is also possible to deliver the initial general subjects for evaluation into the community. If no community of practice can be found, it should be designed. As stated in Chapter 4.3, a community of practice can be designed even if it is by definition natural, spontaneous, and self-directed, but the result cannot be guaranteed. Wenger, McDermott, and Snyder (2002) give useful hints how this can be done in pursuance of the seven principles presented in Chapter 4.3.

One of the next challenges is to persuade several top managers to introduce the subjects. They should be open, honest, and willing to answer questions and discuss issues. A challenge at organizational level is also the guidance and mentoring of the strategic projects. Mentors do not usually have time to take the whole responsibility for it, and they are maybe not familiar with strategic thinking, tools, and methods which would be useful in the projects. They may also be too close to their own domain and branch to offer valuable new viewpoints. An outsider guide, familiar with strategic work and experience from several branches, appeared to be an excellent solution in Case 2. If the goal is to utilize the diversity and creativity of groups, the guide should not lead the project; he/she should only facilitate self-directive work to the extent possible. As a result of Case 2 analysis, it appears to be important to give the subjects of the strategic projects to the guide in good time and also reserve a possibility to discuss the issues with management, so that the guide fully understands the needs behind them. The guiding procedure applied in Case 2 appeared to work well and it can be recommended with the slight modifications presented in the previous chapter. In addition to the communication with the groups, the guide needs discussions with management, mentors, and HRD people. A challenge for HRD people appeared to be keeping the guide up to date when something, e.g. workshop programs, changed. The greatest challenge with mentors will probably be lack of time, as in Case 2. It is also important that the mentors do not start leading the groups. Involving the whole community of practice in the mentoring process is likely to make it easier for the mentor to handle the work load, but it increases the risk that the self-directiveness of the group disappears. It is important that the group has enough negotiability (see Chapter 4.2) in the community so that they are able to influence the practice as well, and not only adopt the identity of a member in a community.

Case 2 showed that selecting the group members is challenging. As stated several times earlier, diversity, good collaboration skills, and basic knowledge of the domain are required. Both the potential members and their superiors should see the goals as valuable and interesting. Many principles applied in Case 2 appeared to work well and can be recommended, e.g. everyone should be able to apply for the learning program, participants should be selected from different organizational units, and, as a rule, a few years' work experience should be required. The selection from different organizational units appeared to work well as a source of diversity, and it also appeared to create a lasting network over unit, department, and division boundaries. In contrast to this, learning style as a selection criteria in the group formation did not show any benefit or get any support from literature, even if it is otherwise useful as a metacognitive tool increasing participants' self-knowledge. A more powerful selection criteria and tool for building powerful groups would, according to theories in Chapter 4, be team roles. They can also be used more easily than learning styles to interpret group dynamical phenomena when collaboration in the group is difficult.

Managing communities of practice is in general challenging because of their informal nature. It is not easy to recognize them in the organization but it can be done e.g. through interviews and social network analyses, as presented above. Communities of practice also easily start to increase boundaries to the rest of the organization when they negotiate meanings within their practice. It is therefore particularly important to manage the boundaries and boundary processes. Wenger, McDermott, and Snyder (2002, p. 154) mention shared projects, knowledge brokers, and boundary objects as connections enhancing boundary activities. All these are already present in the model constructed in this chapter. A strategic project is a shared project with management, the learning group, the community of practice, and hopefully with the superiors of the learners as well. All the participants in the learning group are knowledge brokers, because they are legitimate members in the community of practice, in their organizational unit, and in the learning group. They are members in many communities. The presentation that the learning group gives is a boundary object as well as the tools used in their strategic project. These tools are also used in the community of practice and elsewhere in the organization. It is important to manage all modes of boundary processes. Wenger, McDermott, and Snyder (2002, p. 154) state that the learning potential of an organization lies in the balancing act between well-developed communities of practice and active boundary management.

In Chapter 4.5 imagination and alignment, in addition to engagement, were stated as modes of belonging. The learning architecture, according to Wenger (1998), must offer facilities for each of the three modes. Engagement can be facilitated, e.g. by doing joint tasks, offering possibilities for interaction, taking care of sufficient basic knowledge, giving accountability, giving tools, and ensuring continuity with the duality of participation and reification. This facilitation is already built in the guidance process described in the previous chapter. It just has to be guaranteed that the facilitation reaches the community of practice, not only the learning group. Imagination and alignment are

facilitated as well: the strategic projects offer orientation, possibilities for exploration, convergence, coordination, and jurisdiction (see Chapter 4.5).

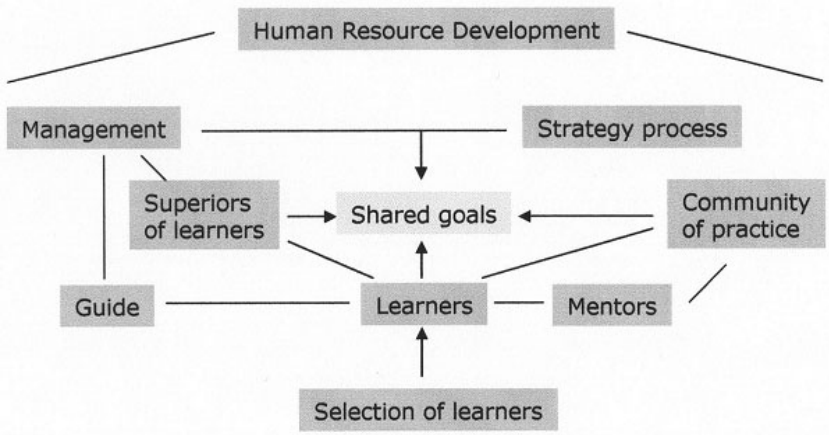

Figure 20 Central factors in management of the entity

Diversity of participants in the entity offers possibilities for reflection. According to Wenger (1998), alignment with institutional organization is ideal if it allows the practices to locate themselves in the constellation of other practices and give them negotiability. The learning groups, which also form a bigger community together, support this by networking with both organizational units and communities of practice. The entity is a combination of both formal and informal endeavoring to maintain a balance between them. The central factors in the management of the entity are presented in Figure 20.

5.2 Consistency of the model

A new model of contextual collaborative learning was developed in Chapter 5.1. It is based on the two cases presented in Chapter 3 and on theories presented in Chapter 4. The main idea of the model is to divide Case 2 type of learning into two parts: a problem-based learning part where basic knowledge in important areas is given in a structured case-based way, and a self-directive part, where strategic projects are carried out as group work participating in a community of practice simultaneously. After presenting the new model several questions arise: how well are the benefits found in the cases left in the new model? What are the best benefits the new model brings compared to the cases? What are the weaknesses of the new model compared to the cases? How difficult is it to apply the new model? This chapter discusses these issues. The starting point is Case 2 because the new model is built more on that case than on Case 1.

The validation started by re-reading Case 2 interviews (19 persons). By using an analysis software (Atlas.ti) the transcripted material was first analyzed by marking quotations which belonged to one of the following categories:

- appeared to work in Case 2 and evidently works in the new model as well (Category 1)
- did not appear to work in Case 2 but evidently works in the new model (Category 2)
- appeared to work in Case 2 but evidently does not work in the new model (Category 3)
- did not appear to work in Case 2 and evidently does not work in the new model either (Category 4)

After a rough first analysis there were 283 quotations which were used as new raw material for a finer analysis based on open coding. After the second analysis there where 130 codes describing different issues worth taking into account when evaluating the new model. Next the codes were grouped under more generic headings to form a big picture of the factors found.

The most central issues in Category 1 (from 108 quotations) were participation of management, networking, existing problems, e.g. tasks originating from the strategy process, and type of guidance. Case 2 offered contextual collaborative learning where strategic understanding and versatile views developed. The groups were self-directive getting help mainly from the guide, mentor, experts, and facilitator. The guide, who did not work in the same organization, offered fresh viewpoints, gave ideas, and got the groups to comprehend the important issues by themselves. He utilized chaos in his guidance. The mentors were experts who coached the groups without interfering too much. Different top experts offered their views in workshops, and the facilitator had the whole learning program well in hand. Case 2 also included structured workshops, case-exercises, literature reviews, simulation exercises in this way combining formal and informal knowledge with the self-directive work done in the groups. In the new model this structured part is separated from the self-directive group work but is included in the entity. The new model does not violate any of these benefits and therefore justifies their belonging to Category 1.

Category 2 (consisting of 93 quotations) also included several central issues: utilization of results, feedback, existence of basic knowledge, selection of group members, and access to information sources. Next each of them is discussed, and reasons for belonging to Category 2 are given.

Utilization of the results in the organization was one of the weakest points in Case 2. Presentations in the evaluation workshop proved to be insufficient, and the learners did not mostly have enough opportunities to use their new knowledge and skills in their work. In the new model better integration of other contexts improves the situation. On the one hand, from the very beginning expert community level context (community of practice) involves several experts in the definition of the problem and in the guidance of the solution. On the other hand, shared goals between learners and their superiors break ground for discussions in the organizational units and in this way for the utilization of new knowledge and skills. In the new model the strategic project solves problems which the whole expert community considers important and participates in guidance. Furthermore the members of the community, who are from different parts of the organization, can utilize the results from the very beginning. As presented in Chapter 4, participation in the negotiations of meanings gives a much deeper understanding of the project for the community members than a single reification, such as the final presentation, can give. Even top management may benefit from this through discussions with experts, and in this way get a better understanding than the final presentation can give. The idea is to involve more people than only the mentor in the strategic project and to create mutual engagement, joint enterprise, and shared repertoire as in the theory of Chapter 4.2. It would also help the type of learners who in Case 2 wished to have more opportunities to discuss with their mentors and different experts. The learners will continue being as community members after finishing the strategic projects, and in this way it is possible for them to develop their knowledge and skills continually, perhaps even as mentors of new strategic projects in future.

The learners often felt that they lacked **feedback** on their strategic projects. Being legitimate members in a community of practice means continuous participation in the negotiations of meanings and consequently continuous feedback. It does not, however, increase feedback given by top management but it may indirectly help in that also. First, they already have the feedback needed to evaluate their work, and, secondly, the quality of feedback given by top management after the final presentations may be better because the management may already have been informed about the results by experts of the community. Having common goals between learners and their superiors also increases feedback.

The learners had great differences in their **basic knowledge and skills** concerning strategic work and team work. Especially dialogical skills and resolution of conflicts appeared to need improvement. This problem was solved in the new model by removing the development of basic knowledge and skills from the entity and taking care of it in separate problem-based learning events.

Good methods applied in Cases 1 and 2, such as case-exercises and simulations, are included in the problem-based learning section of the new model.

Dividing the entity into two parts enables both a sufficient level of basic knowledge and utilization of team roles when **selecting group members** for the second part, i.e. the strategic projects. Learning styles were the only personal factors which were used as criteria when selecting group members for the strategic projects in Case 2. In accordance with the theories in Chapters 4.3 and 4.4, learning styles are useful information for individual self-reflection, but team roles are a more powerful criteria when selecting group members who complement each other. At the same time when team work is coached in problem-based learning, team roles can be mapped and this knowledge used to form new powerful groups.

In Case 2 the learners sometimes found it problematic to **get the needed information** about sensitive issues from the organization for their strategic projects. Having participated in problem-based learning events of the new model, the learners have better basic skills and they already know the central concepts and terminology in the domain. After starting strategic projects the learners are networked with an expert community. All of these together make getting sensitive knowledge and information easier than it was in Case 2.

In addition to the above-mentioned five central issues several more detailed issues, which were somehow problematic in Case 2, can be seen to in the new model. In the first phase of problem-based learning, arrangements can be made to enable learners to choose the subjects of the cases. This makes it easier to define shared goals for learning and is likely to relieve the time pressure as well. It is also easier for HRD-people to understand the level of knowledge and skills and to support the organizational units in developing them if separate, more structured methods of problem-based learning are used. It may also be easier for management and mentor candidates to improve their knowledge and skills if they can choose interesting cases which do not take too much time. For the facilitator it is easier to coach teamwork with structured cases where he/she does not have to concentrate on the content so much. Furthermore, having strategic projects as a separate part enables making the learning event more intensive and duration shorter than it was in Case 2. In a fast developing area this is important because interest is lost as soon as the results are no longer needed in the organization.

Category 3 had no quotations. This indicates that two actions were successful: firstly, efforts were made to base the new model on Case 2 and, secondly, work was done to keep all the benefits of that case in the new model as well. No inconsistency of the model was found with Case 1 results. However, all the problems found in Case 2 were not solved in the new model, which was shown in Category 4 (17 quotations). The most difficult challenge in this category appeared to be related to management of time. The learners had difficulties in fitting strategic projects in their normal work, the superiors in fitting development of personnel in their normal work, and it was also difficult to keep up the interest of top management. The new model does not offer any direct

solution for this more or less value-based problem. Another challenge, found in Case 2 and also present in the new model, is that there are not many good guides, mentors, and experts. Especially the guide is in a key position affecting how successful the learning will be. According to the experiences it is also realistic to expect, e.g. that some of the superiors are not interested in human resource development issues and not all management read the reports made for them. In addition, all learners are hardly ever fully satisfied, all the personal differences cannot be utilized or even tolerated, and guides, mentors, and experts can sometimes lead too much. Furthermore, it is also realistic to expect that guides, mentors, and experts are never available to the degree wished, feedback is at times inconsistent, commitment creates vulnerability, and guides, mentors, and learners may have different levels of ambition. These all belong to Category 4. The new model has no magic tools for them.

The new model also brings challenges not present in Cases 1 and 2 and ones that are impossible to evaluate using the case material. It is e.g. clear that finding and building communities of practice is challenging as well as integrating the contexts together. It is, however, according to literature, possible as presented in Chapter 4.

6 Conclusion

The aim of the research was to find a new model for facilitation of learning in modern enterprise environments. The research started from two consultative projects which appeared valuable for the following reasons:

- there was a strong will and ability to apply the best possible pedagogical practices
- the projects had experienced high-level learning guides

The cases were also attractive for research because they were from different organizations and represented different organizational environments. Case 1 had mainly mechanistic and organic characteristics while Case 2 had mainly organic and dynamic characteristics. The necessary preconditions were also fulfilled: it was possible to participate in the events and make observations, interviews, and questionnaires, and the guides and experts supporting learning were willing to co-operate.

The research began with an exploration of the cases. The exploration phase had three goals: to understand what happened in both cases, to understand the idea and process how the guidance of learning was carried out, and to find the most important elements affecting the outcome of the case. Grounded theories were formed based on observed data, interviews, and questionnaires about the cases. The theories are presented in graphs and in narrative. The main results of the exploration indicate that, firstly, context has a strong effect on motivation and commitment, secondly, collaboration is an efficient way of learning both content and process, thirdly, contextuality does not guarantee the utilization of the learning results in the organization, fourthly, individual differences must be carefully taken into account when designing collaborative learning, and fifthly, the whole spectrum of guiding interventions can be successfully utilized in contextual collaborative learning.

The results of the exploration were used to direct a literature search to find relevant theories for a more general model of contextual collaborative learning. The following questions were presented:
1) What kind of theoretical evidence can be found to support the importance of context in learning, and what kind of disadvantages can contextuality have? What different possibilities are there to utilize contexts? 2) What kind of theoretical evidence can be found to support the importance of collaboration in learning, and what kind of disadvantages can collaboration have? What is needed to facilitate collaboration? 3) What factors concerning individuals should be taken into account in contextual collaborative learning? 4) What is needed to ensure the utilization of learning results in the organization? 5) How should guidance be carried out? How could the whole program of contextual collaborative learning be facilitated? The framework of sociocultural constructivism was used as the main theoretical tool to answer the questions. A model for facilitation of learning was constructed by combining the findings from the empirical data and the relevant theories from literature. Finally the consistency of the model with the empirical data was checked.

The main contribution of the study is a contextual and collaborative learning model which connects three different organizational contexts: organization level, organizational unit level, and expert community level contexts. The model consists of two parts: a problem-based learning part where basic knowledge in important areas is improved in a structured case-based way and a self-directive part, where strategic projects are carried out in groups participating in a community of practice at the same time. The model offers a framework for practical actions to facilitate contextual and collaborative learning in an enterprise environment.

6.1 Contribution of the research

There are models in literature aiming at utilization of different contexts for learning in an enterprise environment, e.g. the hypertext organization by Nonaka & Takeuchi (1995), the community-based hypertext organization by Tuomi (1999), and the double-knit organization by Wenger, McDermott, and Snyder (2002) (see Chapter 4.5). Common to all these models is that they have a knowledge store layer of some type. In the model of Nonaka and Takeuchi it does not exist as an actual organizational entity but in the two others, and also in the triple-knit model developed in this work, it is implemented by using communities of practice. All the models, including the triple-knit model, also have a project team layer of some type. Nonaka and Takeuchi (1995) and Tuomi (1999) separate it from the "business system", where routine operations are carried out, whereas Wenger, McDermott, and Snyder (2002) have them together as a part called "business processes".

In the triple-knit model developed in this work the community of practice and strategic project group form an "organizational community" like Tuomi suggests. "The appropriate way to organize for effective knowledge creation would then be to combine the various types of organizational communities according to the strategic needs of an organization." (Tuomi, 1999, p. 401) How to implement that in practice is one of the contributions of this work and is best seen in Figure 19. Existing communities of practice are utilized and new communities are established according to the strategic needs revealed by the strategy process, and inter-community knowledge sharing is guaranteed by letting the strategic project groups participate in joint workshops. The position of a group within each community of practice depends on the existence of the needed, strategically important knowledge in the organization. If there already are communities of practice in the right areas, the project group will most likely get a rather peripheral position and the mentor of the group will come from the community. If no suitable existing community can be found, the group may form even the core of the community, and the best expert outside the group is asked to be a mentor. Tuomi presents a summary of observations about the implications for skill management and organizational design (Tuomi, 1999, p. 406). The following points, in which practical implementation is possible by using the triple-knit model, can be found in the summary presented by Tuomi:

- "core competencies should be developed by defining their constituent communities of practice, by facilitating social learning within the

communities, by facilitating learning and communication between the constituent communities, and by recruiting central members of the communities in question"
- "social learning and diffusion of innovations within communities of practice should be supported by facilitating communication within the community"
- "learning across communities of practice should be supported by creating mechanisms for inter-community knowledge sharing"

The possibilities of the triple-knit model to make practical implementations of all these items are contributions of this work. They enable the combination of traditional group work and communities of practice in a way which takes the strategic needs into account and increases understanding of the organizational entity.

Also other contributions of the work can be seen. Structured (problem-based learning) and unstructured (self-regulated learning) were combined in a way not found in the existing literature. It makes it possible to develop newcomers all the time in a contextual environment where also collaboration is applied and learned, with support for their learning gradually fading away. A guidance process facilitating this was modelled (Figure 17 and Figure 18). The process combines different fairly well-known practices found in the cases and in literature.

The model best suits the organic and dynamic parts of the organization where there is extensive tacit knowledge and where good abilities of self-regulation are needed. The problem-based parts can be efficiently used for a wide range of people. Strategic projects tie a large number of high level resources to guidance and therefore they are quite expensive to arrange. It is, therefore, a natural choice to offer this kind of learning for persons who have already shown their potentiality as key persons in the organization.

6.2 Evaluation of the research

The evaluation of the research is based on the four aspects of the naturalistic inquiry briefly introduced in Chapter 2.2. These aspects, presented by Lincoln and Guba (1985), are: credibility, transferability, dependability, and confirmability. Each of these four issues is discussed in the following subchapters.

6.2.1 Credibility of the research

Lincoln and Guba (1985) see the achievement of credibility as a twofold task (p. 296): "first to carry out the inquiry in such a way that the probability that the findings will be found to be credible is enhanced and, second, to demonstrate the credibility of the findings by having them approved by the constructors of the

multiple realities being studied." In practice they suggest five major techniques to take care of the credibility (p. 301):

- "activities that make it more likely that credible findings and interpretations will be produced"
- "an activity that provides an external check on the inquiry process"
- "an activity aimed at refining working hypotheses as more and more information becomes available"
- "an activity that makes possible checking preliminary findings and interpretations against archived "raw data""
- "an activity providing for the direct test of findings and interpretations with the human sources from which they have come - the constructors of the multiple realities being studied"

For increasing the likelihood of credible findings and interpretations Lincoln and Guba (1985) suggest prolonged engagement, persistent observation, and triangulation.

Prolonged engagement means investment of sufficient time to learn the "culture", to test for misinformation introduced by distortions either of the self or of the respondents, and to build trust (Lincoln & Guba, 1985, p. 301). In Case 1 there were nine planning meetings in which the researcher participated and five interviews he carried out in the period of time from September 11 to April 27 (over seven months) before the first learning event, i.e. the first workshop, started (see Appendix 1). The time was sufficient to become familiar with the planning group and, in some measure, also with the organizational culture of the unit responsible for the planning. This seven-month-period enabled long discussions, building of trust, and possibilities to test for misinformation introduced by distortions within the planning group. However, the other organizational units involved in workshops and especially the participants of the workshops who came from different countries and from different cultures remained more or less distant. It was possible to become familiar with them only during the three days of the workshops. Observation during three days and short interviews did not give a deep understanding of the cultures the participants represented, it was not possible to test misinformation to a great extent. It is also difficult to say anything about the level of trust. In multinational companies it would be ideal if the researcher in this kind of situation would have an opportunity to visit several units in different countries or even work there before starting the research. It is also recommendable to become familiar with all the organizational units involved in the event.

In Case 2 the researcher participated in the Business School as an ordinary participant in 1998 -1999. This made it possible to become familiar, in advance, with most of the persons in charge in the Business School under research. The researcher knew the organizational culture very well after having worked in different organizational units of that organization for several years. This helped both in testing misinformation and in building trust. The event lasted several months and in this way offered better opportunities than Case 1 to become familiar with the participants and other persons involved in it.

The purpose of **persistent observation** is, according to Lincoln and Guba (1985, p. 304), "to identify those characteristics and elements in the situation that are most relevant to the problem or issue being pursued and focusing on them in detail". According to them, the criterion of trustworthiness in this issue is satisfied, if the researcher is able to describe in detail how the process of tentative identification of the most important issues and detailed exploration of them are carried out. For this research the grounded theory approach was chosen as the method for qualitative analysis because it appeared to provide good tools and systematic propagation for the analysis. The method uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon (Strauss and Corbin, 1990, p.24). It is based on systematic categorization of observations and should result in narrative account of the cases with a perfect fit with the observed data. The method is described in Chapter 2.2 and the implementations of both analyses can be found in Chapter 3 to the extent considered practical. The categories and subcategories of the analyses are shown in Tables 4 and 7, which helps the reader evaluate how well the most relevant ones were chosen to be focused on in Chapters 3 and 4. The grounded theory method was laborious because of the number of different codes it produced. The integration of categories to form theories was carried out by utilizing several techniques mentioned by Strauss and Corbin (1998, p.148): a storyline was written, diagrams were drawn, and memos were reviewed. The process was difficult and time consuming. First the level of abstraction was raised by using higher level headings for the subcategories found in axial coding. Then a preliminary formulation of the storyline was drawn up by writing a few sentences about the whole program. Memos and raw material were reviewed to find the most essential categories and how they were related to the central category. The diagrams were used to visualize the interrelations between categories. Different colors indicated if the category represented a condition, action, or consequence. Several small theories were described in the diagrams trying to explain what actions under what conditions were needed to achieve certain consequences. These pieces were then put on one paper and combined. This way it was possible to see how the entity was formed. The outcomes were checked against the research data and they fitted well to it. The different detailed steps of analysis of both cases are documented and can be reviewed, if needed.

As already stated in Chapter 2.2, three modes of **triangulation** were used in the research:

- data was collected from different sources
- several data collection methods were adapted: observations, interviews and questionnaires
- in some situations another observer was present

In both cases the **sources** used were learners, guides, and management. In Case 1 also some experts were interviewed and a questionnaire was made for superiors which, however, did not succeed. In Case 2 also a mentor, facilitator, and principal were interviewed. A clear weakness in the research data was that the superiors of the learners were not used as sources especially in Case 2. Superiors who were not familiar with the Business School in advance did not

provide any material. The need for that was noticed too late. Otherwise the sources appeared to cover the different aspects needed to understand the cases. At least one learner from each group was interviewed and in Case 2 also all the learners of one group. The number and depth of the interviews in Case 1 was not the best possible because of the short time available for them. In Case 2 the interviews saturated so that the last interviews of the learners did not appear to offer any major new aspects.

The used **methods** were observations documented by writing notes and video-recording, interviews documented by writing notes and audio-recording, and questionnaires documented by making summaries. They appeared to complement each other very well. The slowness in analyzing observations and interviews was problematic resulting in the fact that some of the last questionnaires could have been formulated much better if the cases had been better analyzed before carrying them out.

In Case 1 two **observers** were present all the time and it was possible to compare the observations and discuss them. In both cases it was possible to discuss the observations with the guide and the other people present in the situation. If more resources had been available, the trustworthiness of the research could have been improved by using more people in the analyzing of the video- and audiotapes. In addition to time and money, however, it often is difficult to get permission for even one person to analyze material that is considered very confidential by the different parties involved in it.

An activity that provides an external check on the inquiry process is, according to Lincoln and Guba (1985), **peer debriefing**. They describe it as "a process of exposing oneself to a disinterested peer in a manner paralleling an analytic session and for the purpose of exploring aspects of the inquiry that might otherwise remain only implicit within the inquirer's mind" (Lincoln & Guba, 1985, p. 308). The idea is to probe the inquirer's biases, explore meanings, and clarify the basis for interpretations. In this research peer debriefing was done when the research was presented in a research seminar at the Helsinki University of Technology three times. Two times an opponent was selected who studied the material in detail and asked questions about it. It was also possible, as already stated, to discuss the observation with different people involved in the learning process. The adviser's role was also considerable in debriefing but it was not *peer* debriefing because he is an experienced older professional in the subject area.

Negative case analysis is an activity aiming at refining working hypotheses as more and more information becomes available (Lincoln & Guba, 1985). The idea is continuously refining the hypothesis until it accounts for all known cases without exception (p. 309). In this research the process of grounded theory applies the principle of negative case analysis in axial and selective coding. The aim is that the resulting narrative has a perfect fit with the research data and therefore the narrative was reformulated again and again until the fit existed.

All the activities that improve possibilities to check preliminary findings and interpretations against archived raw data enhance **referential adequacy** (Lincoln & Guba, 1985). In this research almost all the observed situations were videotaped and almost all the interviews audio-recorded. People who have permission from the case organizations can at any time check the findings against this raw data.

Member checking is an activity providing for the direct test of findings and interpretations with the human sources from which they have come - the constructors of the multiple realities being studied (Lincoln & Guba, 1985). In Case 1 the findings and interpretations were discussed and checked in several planning meetings (see Appendix 1) with the guide and mainly one representative of management involved in the case. They agreed with the final description. In Case 2 the findings were mainly discussed with the guide and he also read an early version of the case description. He had no remarks. The credibility of the research would have been better if the interviewed persons had listened to the interviews or read the transcriptions. They were not even asked to due to two reasons: the researcher did not understand its value in time, and the interviewees were very busy. It was already difficult to find time for the interviews.

6.2.2 Transferability of the research

In qualitative research it is not possible to make any precise statements about its external validity, as is the case with e.g. statistical confidence limits in quantitative research. What can be done to improve the applicability is to investigate the **transferability** between two contexts (Lincoln & Guba, 1985). The investigator of the original context cannot imagine in what other different contexts the application of the results may be needed. Therefore, the best that he or she can do, is to provide sufficient descriptive data about the original context to make similarity judgements between "sending" and "receiving" context possible (Lincoln & Guba, 1985, p. 296). Lincoln and Guba speak about "thick description" meaning a description with the help of which it is possible to reach a conclusion about whether transfer can be considered a possibility.

In this research the aim has been to describe the cases in enough detail to make the context clear, but without making the report too difficult to read. Therefore some information which may not appear very relevant is included, e.g. Chapter 3.1.2.1 Notes and minutes of the planning meetings and some quotations of interviews in Chapter 3.2.2.4 Analysis of interviews, but e.g. the details of the grounded theory process were left out.

6.2.3 Dependability of the research

Dependability[27] corresponds to reliability in a conventional research. In qualitative research reliability is seen as part of a larger set of factors associated with observed changes (Lincoln & Guba, 1985, p. 299). According to Lincoln and Guba, dependability takes both factors of instability and factors of phenomenal or design induced change into account. The research design changes constantly according to the results achieved, which has its own effect on the results. Therefore the research report should carefully describe both the process and the products which may have changed it to be dependable.

In this research the following means were used to ensure as high a degree of dependability as possible:

- researcher's preconceptions and way of thinking were described in Chapter 1.2
- the grounded theory process applied was documented and is available in greater detail than in this report, if needed
- quotations have been documented by using their original language
- research method included several checks of the findings against the raw data

The following shortcomings concerning dependability were noticed:

- some expressions used in the interviews and questionnaires were ambiguous or contained preconceptions
- number of participants in questionnaires was too small to have any statistical significance
- it was not possible to analyze all the research data collected

6.2.4 Confirmability of the research

"Confirmability refers to the degree to which the results could be confirmed or corroborated by others" (Trochim, 2002). Lincoln and Guba (1985) also see that the emphasis of confirmability should be on data. In this research confirmability was taken care of by the following means:

- raw data were video- and audiorecorded making it possible to return to it in its original form
- transcriptions of the raw data are available if needed
- intermediate results (e.g. the results of the questionnaires) are documented and available if needed

The following shortcomings concerning confirmability were noticed:

[27] "If you say that someone or something is **dependable**, you mean you can be sure that they will always act consistently or sensibly, or do what you need or expect them to do." (Collins Cobuild English Dictionary, 1995)

- thoughts and preliminary ideas which did not necessarily lead anywhere should have been documented better
- a systematic diary of different communication around the cases was started but was given up when the workload was at its highest

6.3 Proposals for further research

The triple-knit model of contextual and collaborative learning developed in this dissertation is based on the exploration of two cases and on literature review directed by the results of the exploration. Although the exploration phase showed the functionality of many parts of the model, it was not possible to test the whole model within this research. Based on the qualitative work done in this research, however, important factors affecting the contextual and collaborative development of expertise in an enterprise environment are better understood now. This makes it possible to operationalize central concepts and develop the model further with the help of quantitative analysis.

Areas of special interest for further research would be

- tools for identification and development of communities of practice in the organization
- conditions under which learning groups are accepted as legitimate members into a community of practice
- boundary objects which increase understanding between communities and formal organization
- ideal properties of strategic level tasks in the triple-knit learning model
- performance indicators of the model in and between the three contexts (e.g. networking at different levels)
- follow-up tools with which all the parties involved could continuously follow the performance indicators of the model and start corrective actions if needed
- selection and coaching of guides for the triple-knit model
- development of problem-based starting modules where the main emphasis would be on collaborational skills but where the learning of the substance could be easily integrated to achieve the required starting level for self-regulated strategic work
- building of learning groups for best possible outcome (e.g. competencies achieved, networking, understanding of the entity, collaborative skills)

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Appendix 1

Description of the main results of the events in Case 1

Date of the event	Event and its main results
11 September, 1998	Planning meeting 1 o shared understanding of the present situation o rough idea of the purpose of the project: development of new learning solutions by implementing trials o agreement on the need of a project plan with clearly defined goals o rough outline to concentrate on units already using information technology
1 October, 1998	Planning meeting 2 o presentation of one set of learning solutions and tools o three possible training courses for trials found o decision that the customer organization sharpen the preliminary ideas and select one suitable case for trial
2 November, 1998	Planning meeting 3 o unit where the trial would be made was decided (Training Center) o the decentralized sales support teams were fixed as the target o head of the project was nominated o information on the needs for learning outcomes was given to the consultant o learning based on real cases was considered a good idea
11 December, 1998	Planning meeting 4 o first draft of the structure of the learning body o first discussion on measurement of learning outcomes o first requirements for the learning environment discussed
20 January, 1999	Planning meeting 5 o decision to concentrate on pedagogical needs first and then specify the learning environment o a great deal of useful discussion -> shared understanding o defining the learning body
12 February, 1999	Planning meeting 6 o critical factors of the product design process were outlined o applied critical incident technique was chosen as a working method
3 March, 1999	Planning meeting 7 o lot of discussion on pedagogy -> shared understanding o decision to have the first trial in April
31 March, 1999	Planning meeting 8 o supporting the project manager in planning the first workshop

14 April, 1999	Planning meeting 9 ○ plan for collecting the information and using the applied critical incident technique was presented and accepted
20 April, 1999	One expert interview ○ director of the unit responsible for sales support in most countries
21 April, 1999	Four expert interviews ○ person responsible for the implementation of sales support ○ marketing manager ○ tool designer and trainer ○ tool designer
27 April, 1999	Workshop 1, 1st day ○ orientation ○ case: assessment of customers' capacity needs
28 April, 1999	Workshop 1, 2nd day ○ case: tendering with process tools ○ case: ordering with process tools ○ test: order within one hour
28 April, 1999	Two interviews: ○ learner ○ expert from production (receives orders from local units)
29 April, 1999	Workshop 1, 3rd day ○ full cost pricing ○ groupwork: best solution for the case ○ B-process ○ discussion
11 May, 1999	Planning meeting 10 ○ reflection of the first workshop and refining the second workshop ○ decision to videotape the second workshop
18 May, 1999	Workshop 2, 1st day ○ orientation ○ case 1 ○ exercise: who makes the lowest tender
19 May, 1999	Workshop 2, 2nd day ○ discussion on the price differences (reflection of the tender exercise) ○ case 2
19 May, 1999	Seven interviews ○ 4 learners, learning guide, pedagog (observer), tool designer/trainer
20 May, 1999	Workshop 2, 3rd day ○ repetition of important points ○ groupwork: customer consultation ○ test: order within one hour ○ expert lectures on wanted product details and marketing
20 May, 1999	Three interviews ○ learning guide, learner, pedagog (observer)

8 June, 1999	Planning meeting 11 o reflection of the workshops o preliminary summaries of the questionnaires discussed o decision to make a follow-up questionnaire for learners and their superiors
11 June, 1999	Expert interview o expert of export and joint venture operations
30 June, 1999	Planning meeting 12 o summaries of the questionnaires and interviews discussed o follow-up questionnaire refined o combined sales and support training discussed
19 August, 1999	Planning meeting 13 o discussion on learning environment specifications o decision to analyze critical factors first o decision to look into possibilities to use simulation with training sales and support people together o answers to follow-up questionnaires still missing
7 October, 1999	Planning meeting 14 o analysis of follow-up questionnaire discussed o first drafts of possible issues for critical factors discussed o decision that customer organization would refine the phrasing of the issues o presentation on possibilities of simulation in learning
18 November, 1999	Planning meeting 15 o refining the phrasing of the possible issues for critical factors
8 December, 1999	Planning meeting 16 o first results of critical factors presented o decision to combine the two questionnaires of critical factors and to clarify unclear questions o decision to ask the improved questions again and arrange a discussion after that
14 January, 2000	Planning meeting 17 o presentation of critical factors and discussion o first outlines of effects on the learning environment design o decision to prepare the first specifications for the learning environment and clarify other implications originating from the critical factors
4 February, 2000	Planning meting 18 o presentation of the first specifications for the learning environment
17 February, 2000	Planning meeting 19 o refining the specifications together

Appendix 2

Questionnaire forms used in Case 1 (second workshop)

1 Questionnaire to evaluate the starting and end levels of the learners

(made by the learning guide of the workshop)

Below you find list of tasks. Mark X to one of columns: Nice to know, Support or Main responsibility depending of your role in ESC.
Mark **Nice to know** if you are not doing this task but from your own improvement viewpoint you have interest on this subject.
Mark **Support** if you must know how to carry out the task and you may have to advise, support or give information to someone else.
Mark **Main responsibility** if you spend majority of your work time on this subject.

Evaluate actual skill level and wanted skill level to each task on scale 1 - 5.
1 means that you have no related skills
-
5 means that you are able to carry out the task independently and fluently

		Nice to know	Support	Main responsibility	Skill level 18.5.99	Wanted skill level	After course level
	Order Bound Activity						
	Consulting						
	- design calculation						
	- preliminary layout drawings						
	- sketches (design drawings)						
	- site survey						
	- budget price						
	- scheduling (preliminary)						
	- product configuration (preliminary specification)						
	Sales (tendering)						
	- specification analysis						
	- tender drawings						
	- pricing/selling price						
	- estimating costs						
	- technical support to sales						

	Ordering						
	- technical specification						
	- General Arrangement (layout) drawings						
	- presentation drawings						
	- Bill Of Material						
	- scheduling						
	- archiving						
	Logistics/timing						
	- detailed plan						
	- coordination and site management						
	Local material/Purchasing						
	- pre-engineering and updating						
	- engineering for order						
	- ordering						
	Documentation						
	- local documentation (for customer and authorities)						
	- birth certificate						
	Warranty Issues						
	- external						
	- internal						
	- corrective actions						
	Non-Order Bound Support Activity						
	Product Management / Change Management						
	- feedback coordination / improvement actions						
	Documentation						
	- translations						
	Tendering/Sales						
	- price list/market price						
	- salesman's training						
	Local Material Purchasing						
	- supply scope						
	Ordering						
	- customization of tools (Translation of texts)						
	- training of engineering						
	Product details						
	-Product x						
	-Product y						
	-Product z						
	-etc.						
	Other, specify below						

2 Preliminary questionnaire for research purposes

(made by the researcher)

Preliminary questionnaire Date:

Name:

Please answer the following questions:

What are your expectations of the course? What specifically would you like to learn? What are your goals in the course?

How do you learn best?

Which concepts should be defined to avoid misunderstandings (related for example to tools, processes, products, documentation)?

What know-how do you feel you will mostly need in future as a B-process support person?

By what kind of method would you like to evaluate your performance as a B-process support person (what kind of method of self evaluation would you like most)?

3 End questionnaire for research purposes

(made by the researcher)

End questionnaire Date:

Name:

Please answer the following questions:

What did you learn? Which goals did you reach and which not?

Where did the trainers succeed and what would need improvement?

What would have been a more efficient way for you to learn?

What know-how do you feel you will mostly need in future as a B-process support person?

By what kind of method would you like to evaluate your performance as a B-process support person (what kind of method of self evaluation would you like most)?

4 End questionnaire for general feedback about the workshop

(standard form made by the organization)

Course evaluation

Please help us to improve the quality of our training by evaluating the course that you have attended. For each of the following issues circle the number on the 1-4 scale which best corresponds with your own opinion.
If you would like to add any comments / suggestions, please include them in the available spaces.
Course:
Date:

1	The course objectives were clearly explained.	4 3 2 1	The course objectives were not explained

Comments:

2	The course objectives were achieved.	4 3 2 1	The course objectives were not achieved.

Comments:

3	The course objectives were in accordance with my needs and skills.	4 3 2 1	The course objectives were not in accordance with my needs and skills.

Comments:

4	The course contents were well structured and easy to follow.	4 3 2 1	The course contents were poorly structured and difficult to follow.

Comments:

5	The training methods that were used worked effectively in this course.	4 3 2 1	The training methods that were used were inappropriate for this course.

Comments:

6	The training material that was distributed was very useful.	4 3 2 1	The training material that was distributed was not useful.

Comments:

7	The atmosphere during the training was very helpful to my learning.	4 3 2 1	The atmosphere during the training restricted my learning.

Comments:

8	The administrative arrangements for the course were excellent.	4 3 2 1	The administrative arrangements for the course were poor.

Comments:
Name:

Supplementary questions:

Were the training objectives known to you before coming on the course? If yes, where did you find them?
Was the level of difficulty in the training appropriate to your needs?
What were the most useful parts for you in the course?
What changes or improvements do you think might be needed in the course?
Other comments:

5 Follow-up questionnaires to evaluate the transfer of learning or long-term results

(made by the researcher)

5.1 Questionnaire about the effectiveness of the course

Note: This questionnaire was intended for the learners of all workshops but it was either not sent at all or nobody returned it. However, some learners sent the form intended for their superiors (see the next form).

The purpose of this questionnaire is to analyse the effectiveness of the course. We kindly ask you to answer still these questions because after having possibility to apply the skills one usually is in a better position to evaluate the real profitability of the course. Please fill in the answers and mail the questionnaire back as soon as possible, not later than 10th August 1999.

5 = very much, 1= not at all	5	4	3	2	1
Effectiveness of the course					
The course helped me to know the product better					
I am able to give better support to my external and internal clients than before the course					
Calculating the budget price by using tools is easier than before the course					
Making the configuration (preliminary specification) is easier than before the course					
Specification analysis is easier to do than before the course					
Estimating costs by using the tool (and taking the local costs into account) is easier than before the course					
Giving technical support to sales is easier than before the course					
Making technical specifications is easier than before the course					
Making translations to documentation is easier than before the course					
I have noticed improvement in my work because of the course					
I have noticed that I can do more than before the course					
It is easier to contact support people in Finland now than before the course					
B-process in general					
I am able to use the tool 1					
I am able to use the tool 2					
I am able to utilize B-process in my work					
The tools and B-process really help me in my work					
It is easy to design a product according to the B-process					
Interaction with factory					
I have contacted support people in Finland after the course to learn more					
I have given feedback to improve the tools after the course					

Ideas for improvement					
I think everybody should bring his/her own cases in to be processed on the course					
I would like to utilize Intranet for sharing experiences with other support people					

What training would you need in the near future?

What would be the best way to give that training?

How could you learn better when working (without ordinary courses)?

	yes	**no**
I use e-mail at least once a week		
I use Internet at least once a week		
I am willing to participate if on-line training is available on the Intranet.		

5.2 Questionnaire about the effectiveness of the course

(sent to the supervisors of the participants)

The purpose of this questionnaire is to analyse the effectiveness of the course which your subordinate participated in, and at the same time collect some information how you feel about B-process. We kindly ask you to answer these questions because the real effectiveness of the course is impossible to evaluate without it. The answers are treated confidentially and they are used to improve training at The Company. Please fill in the answers and mail the questionnaire back as soon as possible, not later than 10th August 1999.

5 = very much, 1= not at all	5	4	3	2	1
Effectiveness of the course					
Course participants have shown improvement in the work performance after the course					
Co-operation between sales and technical support work better than before the course					
I feel that our know-how has improved because of the course					
ESC-tools are utilized better in my unit than before the course					
B-process in general					
We are able to use KCT2					
We are able to use Data Converter					
We are able to utilize B-process when necessary					
The tools and B-process really help our work					
The number of B-process orders has increased compared to last month					
The number of B-process orders has increased because of the course					
We are more competitive now than before the B-process					
B-process tools have made our customer service better					
B-process tools have shorten our planning times					
B-process has shorten our delivery times					
Interaction with the factory					
Did the course have any affect on the improvement of interaction between your unit and factory					
Ideas for improvement					
I would like to utilize Intranet for sharing experiences with other ESC people					

Usage of e-mail and Internet	**yes**	**no**
I use e-mail at least once a week		
I use Internet at least once a week		
On-line training on the Intranet would be a good idea		

What kind of training would your unit need in the near future?

What would be the best way to give that training?

Would you like to facilitate learning on the job better (without ordinary courses)? If yes, what kind of help would you need for that?

On what arguments is your decision based when thinking if the course is worth of the money it takes?

How could we give more value to the course?

Appendix 3

Summary of the questionnaires in Case 1

1 Analysis of the learning needs																
	Learning need								**Main responsibility**							
	(difference between present															
	level and wanted level)								(2 if there is need for							
Order Bound Activity	Bold = Main responsibility								learning in the main area							
	Underlined = Support function								Responsibility, 1 if in the support area)							
Learners	L1	L2	L3	L4	L5	L6	L7		L1	L2	L3	L4	L5	L6	L7	
Consulting								Sum								**31**
- design calculation	3	0	1	2	2	2	1	11	1			1	1	1		4
- preliminary layout drawings	2	0	3	4	**4**	**0**	4	17			1	1	2		1	5
- sketches (design drawings)	2	0	3	4	**0**	**0**	4	13			1	1			1	3
- site survey	0	0	3	3	0	1	0	7			1					1
- budget price	**1**	0	3	2	2	2	**2**	12	2		1	1	1	1	2	8
- scheduling (preliminary)	0	0	3	**3**	0	0	4	10			1	2			1	4
- product configuration (preliminary specification)	3	0	3	3	**1**	1	4	15	1		1	1	2		1	6
Sales (tendering)								0								**41**
- specification analysis	**2**	0	3	**2**	0	1	4	12	2		1	2		1	1	7
- tender drawings	0	0	3	**3**	**3**	**1**	4	14			1	2	2	2	1	8
- pricing/selling price	**1**	2	3	**2**	2	1	2	13	2		1	2	1		1	7
- estimating costs	**1**	2	3	**3**	1	3	2	15	2		1	2	1	1	1	8
- technical support to sales	**2**	0	3	**2**	**2**	**2**	**1**	12	2		1	2	2	2	2	11
Ordering								0								**33**
- technical specification	2	0	3	3	2	2	**4**	16	1		1	1	1	1	2	7
- General Arrangement (layout) drawings	1	0	3	3	**4**	**1**	**4**	16			1	1	2	2	2	8
- presentation drawings	1	0	3	4	2	2	**4**	16			1		1	1	2	5
- Bill Of Material	1	0	3	3	0	3	**4**	14			1			1	2	4
- scheduling	1	0	3	3	0	**0**	**4**	11			1				2	3
- archiving	1	0	3	3	1	**2**	**4**	14			1		1	2	2	6
Logistics/timing								0								**1**
- detailed plan	1	1	1	3	0	0	0	6	1							1
- coordination and site management	0	1	1	3	0	0	0	5								0
Local material/Purchasing								0								**11**
- pre-engineering and updating	0	0	1	3	1	**1**	0	6					1	2		3
- engineering for order	0	0	1	3	**2**	**0**	0	6					2	2		4
- ordering	0	0	1	3	**2**	**0**	0	6					2	2		4
Documentation								0								**8**
- local documentation (for customer and authorities)	0	2	1	3	2	**1**	2	11				1	1	2	1	5
- birth certificate	0	2	1	3	1	0	2	9				1	1		1	3
Warranty Issues								0								**10**
- external	0	0	1	4	0	1	2	8				1		1	1	3
- internal	0	0	1	4	0	1	2	8				1		1	1	3
- corrective actions	0	0	1	3	0	**1**	2	7				1		2	1	4
								0								0

Non-Order Bound Support Activity																
Product Management / Change Management																
- feedback coordination / improvement actions	0	**2**	0	3	0	**2**	2	9		2			2			4
Documentation								0								
- translations	1	**3**	0	2	0	2	4	12	1	2		1		1	1	6
Tendering/Sales								0								**14**
- price list/market price	**1**	**2**	1	**2**	0	0	0	6	2	2		2				6
- salesman's training	1	**2**	2	**3**	**0**	3	2	13	1	2	1	2		1	1	8
Local Material Purchasing								0								
- supply scope	0	3	2	3	0	0	2	10		1					1	2
Ordering								0								**13**
- customization of tools (Translation of texts)	0	**3**	3	3	0	**3**	2	14		2	1	1		2	1	7
- training of engineering	0	2	3	3	0	**2**	2	12		1	1	1		2	1	6
Product details								0								**34**
-Product x	**1**	**2**	3	**2**	**1**	1	0	10	2	2	1	2	2	1		10
-Product y	**2**	**4**	3	**2**	3	**2**	2	18	2	2	1	2	1	2	1	11
-Product z	**2**	3	3	**3**	**3**	3	0	17	2	1	1	2	2	1		9
-Product v	0	0	3	**4**	1	2	0	10			1	2	1			4
Other, specify below																**4**
- regulations + directive						**2**						2				2
- where to adress feedback to business unit						**2**						2				2

Reference Figure (RF) was defined to be able to evaluate the importance of each main target area and to evaluate later the learning results by comparing it to the Progress Figures (defined later). Reference Figures indicate the needs of learning and are calculated for each main target area (heading) as follows:

$$RF = \left(\sum_{i}^{k} (n1_i \times 1 + n2_i \times 2) \right) / k$$

where
n1 = number of learners with learning needs in his/her support area
n2 = number of learners with learning needs in his/her main responsibility area
i = index of the item in the main target area (under the heading)
k = number of items in the main target area (under the heading)

If the need is in the learner's main responsibility area, it is weighted by multiplying it by two. If it is in the learner's support area, it is not weighted. The maximum value with seven learners is thus 14 (if all the items are in the main responsibility area of each learner and all the learners with learning needs in every item).

Reference Figures of target areas where learning was needed most are as follows:

Product details	RF = 8.5
Sales (tendering)	RF = 8.2
Tendering/sales (non-order bound)	RF = 7.0
Ordering (non-order bound)	RF = 6.5
Ordering (order bound)	RF = 5.5
Consulting	RF = 4.4

2 Analysis of the learning progress

	Learning progress								**Main responsibility**							
	(difference between present															
	level and after course level)								(2 if there is progress							
Order Bound Activity	Bold = Main responsibility								in the main responsibility area							
	Underlined = Support function								1 if in the support area)							
Learners	L1	L2	L3	L4	L5	L6	L7		L1	L2	L3	L4	L5	L6	L7	
Consulting								Sum								**16**
- design calculation	1	0	0	1	0	1	0	3	1			1		1		3
- preliminary layout drawings	0	0	0	0	**0**	**0**	2	2							1	1
- sketches (design drawings)	0	0	0	0	**0**	**0**	2	2							1	1
- site survey	0	0	0	0	0	0	0	0								0
- budget price	**1**	0	0	0	2	0	**1**	4	2				1		2	5
- scheduling (preliminary)	0	0	0	**0**	0	0	2	2							1	1
- product configuration (preliminary specification)	1	0	2	0	**1**	0	2	6	1		1		2		1	5
Sales (tendering)								0								**23**
- specification analysis	**1**	0	2	**1**	0	0	2	6	2		1	2			1	6
- tender drawings	0	0	0	**0**	**0**	**0**	2	2							1	1
- pricing/selling price	**1**	3	2	**1**	3	2	1	13	2		1	2	1		1	7
- estimating costs	**1**	3	0	**0**	0	1	1	6	2					1	1	4
- technical support to sales	**1**	0	1	**0**	**1**	**0**	**0**	3	2		1		2			5
Ordering								0								**12**
- technical specification	1	0	0	1	0	0	**2**	4				1			2	3
- General Arrangement (layout) drawings	0	0	0	0	**0**	**0**	**2**	2							2	2
- presentation drawings	0	0	0	1	0	0	**2**	3							2	2
- Bill Of Material	1	0	0	1	0	1	**2**	5						1	2	3
- scheduling	1	0	0	0	0	**0**	**2**	3							2	2
- archiving	1	0	0	0	0	**0**	**0**	1								0
Logistics/timing								0								**0**
- detailed plan	0	1	0	1	0	0	0	2								0
- coordination and site management	0	0	0	1	0	0	0	1								0
Local material/Purchasing								0								**3**
- pre-engineering and updating	0	0	0	0	0	**0**	1	1							1	1
- engineering for order	0	0	0	1	**0**	**0**	1	2							1	1
- ordering	0	0	0	1	**0**	**0**	1	2							1	1
Documentation								0								**3**
- local documentation (for customer and authorities)	0	0	0	0	1	**0**	2	3					1		1	2
- birth certificate	0	0	0	0	0	0	2	2							1	1
Warranty Issues								0								**3**
- external	0	0	0	0	0	0	2	2							1	1
- internal	0	0	0	0	0	0	2	2							1	1
- corrective actions	0	0	0	0	0	**0**	2	2							1	1
								0								0

Non-Order Bound Support Activity																
Product Management / Change Management																
- feedback coordination / improvement actions	0	**-1**	0	0	0	**0**	0	-1								0
Documentation								0								
- translations	0	**1**	0	0	0	0	0	1		2						2
Tendering/Sales								0								**10**
- price list/market price	**0**	**1**	0	**1**	0	0	0	2		2		2				4
- salesman's training	1	**1**	1	**1**	**0**	0	0	4	1	2	1	2				6
Local Material Purchasing								0								
- supply scope	0	0	0	0	0	0	2	2							1	1
Ordering								0								**3**
- customization of tools (Translation of texts)	0	**0**	0	0	0	**0**	0	0								0
- training of engineering	0	2	1	0	0	**0**	1	4		1	1				1	3
Product details								0								**16**
-Product x	**0**	**0**	1	**1**	**0**	0	0	2			1	2				3
-Product y	**1**	**2**	1	**1**	1	**0**	1	7	2	2	1	2	1		1	9
-Product z	**1**	0	0	**0**	**1**	0	0	2	2				2			4
-Product v	0	0	0	**0**	0	0	0	0								0
Other, specify below																**0**
- regulations + directive						**0**										0
- where to adress feedback to business unit						**0**										0

Progress Figure (PF) was defined to see how much progress was made in each main area (heading). The number must be compared to the Reference Figure (an absolute maximum value for the Progress Figure if the progress is ideal) to get an idea how well the needs were met. The Progress Figure is calculated as follows:

$$PF = \left(\sum_{i}^{k} (p1_i \times 1 + p2_i \times 2) \right) / k$$

where
p1 = number of learners making progress in their support area
p2 = number of learners making progress in their main responsibility area
i = index of the item in the main target area (under the heading)
k = number of items in the main target area (under the heading)

The Benefit Ratio (BR) was defined to evaluate how much the needs were met. It is calculated as follows: BR = 100 x PP/RP %

The following Progress Figures and Benefit Ratios were calculated for the most needed areas:

Product details	RF = 8.5	PF = 4.0	BR = 47 %
Sales (tendering)	RF = 8.2	PF = 4.6	BR = 56 %
Tendering/sales (non-order bound)	RF = 7.0	PF = 5.0	BR = 71 %
Ordering (non-order bound)	RF = 6.5	PF = 1.5	BR = 23 %
Ordering (order bound)	RF = 5.5	PF = 2.0	BR = 36 %
Consulting	RF = 4.4	PF = 2.3	BR = 52 %

If every learner had made progress in their important areas, the Benefit Ratio would be 100 %. If there had been no progress at all in their important areas, the Benefit Ratio would have been 0 %.

3 End questionnaire for general feedback about the workshop

(standard form made by the organization)
Note: The mean values of the first and second workshops are marked under each scale.

Course evaluation

Please help us to improve the quality of our training by evaluating the course that you have attended. For each of the following issues circle the number on the 1-4 scale which best corresponds with your own opinion.
If you would like to add any comments / suggestions, please include them in the available spaces.

Course:

Date:

1	The course objectives were clearly explained.	4 3 2 1 **2,9 3,1**	The course objectives were not explained
Comments:			
2	The course objectives were achieved.	4 3 2 1 **2,7 2,4**	The course objectives were not achieved.
Comments:			
3	The course objectives were in accordance with my needs and skills.	4 3 2 1 **2,4 2,7**	The course objectives were not in accordance with my needs and skills.
Comments:			
4	The course contents were well structured and easy to follow.	4 3 2 1 **2,9 2,5**	The course contents were poorly structured and difficult to follow.
Comments:			
5	The training methods that were used worked effectively in this course.	4 3 2 1 **2,7 2,7**	The training methods that were used were inappropriate for this course.
Comments:			
6	The training material that was distributed was very useful.	4 3 2 1 **2,7 2,0**	The training material that was distributed was not useful.
Comments:			
7	The atmosphere during the training was very helpful to my learning.	4 3 2 1 **3,4 3,3**	The atmosphere during the training restricted my learning.
Comments:			
8	The administrative arrangements for the course were excellent.	4 3 2 1 **3,7 3,3**	The administrative arrangements for the course were poor.
Comments:			

Name:

4 Summary of the results of the follow-up questionnaires

Questionnaire about the effectiveness of the course

(sent to the supervisors of the participants)

Note: This questionnaire was intended for the superiors of the learners. Only one superior returned it but surprisingly also 12 learners returned it. The distribution of the evaluation (13 answers) is marked with bold figures in each row.

The purpose of this questionnaire is to analyse the effectiveness of the course which your subordinate participated in, and at the same time collect some information how you feel about B-process. We kindly ask you to answer these questions because the real effectiveness of the course is impossible to evaluate without it. The answers are treated confidentially and they are used to improve training at The Company. Please fill in the answers and mail the questionnaire back as soon as possible, not later than 10th August 1999.

5 = very much, 1= not at all	5	4	3	2	1
Effectiveness of the course					
Course participants have shown improvement in the work performance after the course	**2**	**2**	**6**	**2**	**1**
Co-operation between sales and technical support work better than before the course	**0**	**3**	**5**	**2**	**3**
I feel that our know-how has improved because of the course	**3**	**3**	**6**	**1**	**1**
ESC-tools are utilized better in my unit than before the course	**0**	**8**	**3**	**2**	**1**
B-process in general					
We are able to use KCT2	**2**	**7**	**3**	**1**	**0**
We are able to use Data Converter	**2**	**5**	**4**	**1**	**1**
We are able to utilize B-process when necessary	**0**	**5**	**6**	**1**	**1**
The tools and B-process really help our work	**1**	**3**	**4**	**4**	**1**
The number of B-process orders has increased compared to last month	**0**	**0**	**4**	**3**	**5**
The number of B-process orders has increased because of the course	**0**	**0**	**3**	**5**	**4**
We are more competitive now than before the B-process	**0**	**3**	**5**	**2**	**2**
B-process tools have made our customer service better	**1**	**2**	**4**	**4**	**1**
B-process tools have shorten our planning times	**1**	**1**	**4**	**3**	**3**
B-process has shorten our delivery times	**1**	**0**	**2**	**4**	**5**
Interaction with the factory					
Did the course have any affect on the improvement of interaction between your unit and factory	**0**	**4**	**1**	**5**	**3**
Ideas for improvement					
I would like to utilize Intranet for sharing experiences with other ESC people	**6**	**1**	**6**	**0**	**0**

Usage of e-mail and Internet	**yes**	**no**
I use e-mail at least once a week	**10**	**1**
I use Internet at least once a week	**8**	**3**
On-line training on the Intranet would be a good idea	**8**	**3**

Appendix 4

Program of Internal Business School 6

Internal Business School 6: Timetable

Development of Strategic Competencies:

Workshop 1: New Challenges in Telecommunication	24.-26.5.1999
Starting point of Strategic Projects	18.8.1999
Strategic clinic (0.5 day/group)	6.-8.9.1999 9-12.30 and 13-16
Workshop 2: Strategy	4.-6..10.1999
Workshop 3: Service and Marketing	9.-11.11.1999
Workshop 4: Management of Change	8.-10.12.1999
Intermediate reporting (0.5 day/group)	20.-22.12.1999
Delivery of Strategy Works	
Workshop 5: Evaluation	8.-10.2.2000
Closing Seminar	10.3.2000

Literature

Development of Operative Competencies

TALO Finance and Accounting Module	18.-19.10.1999
VOIMA How to survive in chaos; team working	23.-24.11.1999
GLOBE Negotiation skills; International know-how	24.-25.1.2000
Media I	2.-3.9.1999
Media II	30.-31.3.2000

Appendix 5

Questionnaire of Case 2

1 Questionnaire form used (in Finnish)

Eräs IBS:n viimeisimpiä kyselyjä on edessäsi. Mieti huolellisesti, sillä voit vaikuttaa tulevien IBS:ien muodostumiseen vielä huikeammiksi elämyksiksi kuin tämä oli…

Ympyröi lähinnä omaa mielipidettäsi oleva vaihtoehto. Ääripäät on kuvattu sarakkeissa.

Valmennusta tiimityöhön oli liian vähän	1 2 3 4 5	Valmennusta tiimityöhön oli liikaa
Osasimme toimia tiiminä hyvin	1 2 3 4 5	Emme osanneet toimia tiiminä
Presentoinnin (erityisesti loppuesityksen) valmennusta oli liian vähän	1 2 3 4 5	Presentoinnin valmennusta oli liikaa
Strategiatyön tekoaika oli liian lyhyt	1 2 3 4 5	Strategiatyön tekoaika oli liian pitkä
Strategiatyön tavoitteet kuvattiin riittävän hyvin ja selkeästi	1 2 3 4 5	Tavoitteet valkenivat vasta evaluaatiotilaisuudessa.
IBS:n sisällöt tulivat tosi tarpeeseen	1 2 3 4 5	IBS:n oppeja saatan ehkä voida soveltaa joskus tulevaisuudessa
Olisin kaivannut jonkin väliportaan ennen IBS:ää pystyäkseni saamaan täyden hyödyn sen annista.	1 2 3 4 5	IBS oli liian kevyttä kamaa, haasteellisuutta lisää!
Olisin kaivannut enemmän luettavaa käsitellyistä asioista	1 2 3 4 5	Luettavaa oli IBS:llä liikaa
Opiskelin ainoastaan työajalla	1 2 3 4 5	Opiskelin ainoastaan vapaa-ajallani

Kommentteja:

Olen pitänyt yhden tai useamman esityksen IBS:n opeista omassa yksikössäni	Olen En ole
Olen sparrannut tai muuten piinannut työkavereitani IBS:stä saaduilla ajatuksilla ja ideoilla	Paljon Vähän En ollenkaan
Ilmoittautumisen yhteydessä olisi hyvä olla karkea kuvaus ajan tarpeesta ja sen jakautumisesta, ja esimiehen tulee antaa tähän ajankäyttöön suostumus.	Hyvä Tarpeeton
Business Planin teolle pitäisi olla oma opiskelumodulinsa	Joo Ei tarvita
Jos case-juttuja voisi opiskella itsenäisesti tutorin opastuksella, käyttäisin tilaisuutta hyväkseni.	Aivan varmasti Ehkä En todellakaan

Strategiatyöryhmän toiminnasta tiiminä pitäisi saada ulkopuolista palautetta	Ehdottomasti No jaa… Ajan hukkaa
Ohjaussessioita strategiatöihin pitää saada lisää.	Jep No ei!
Ohjaussession ihannepituus on	tuntia
Ohjaussessioiden sopiva määrä koko strategiatyöprosessin aikana	on kertaa
Kirjallisuusvihjeitä eri aihealueilta sisältökuvauksineen pitäisi olla saatavilla	Runsaasti Valikoituja Ei tarvitse
Kaipaisin enemmän keskustelua esimieheni kanssa IBS-oppien hyödyntämisestä	Joo En
Kaipaisin enemmän keskusteluja esimieheni kanssa omasta tulevaisuuden kehittymisestäni	Joo En
Emme saaneet mielestäni toimia ryhmänä riittävän itsenäisesti	Totta Päinvastoin
Sain ajatukseni ryhmätöissä riittävästi esille	Joo en ihan
Väliraportoinnin paras ajankohta on kun strategiatöille varatusta	ajasta on kulunut %
Kaikesta tekemästäni työstä tein kotona	%

Kommentteja:

Arvioi seuraavien sähköisen oppimisympäristön toimintojen hyödyllisyys IBS:ssä (oletetaan käyttöliittymä ja tekninen toimivuus erinomaiseksi): 5 = äärimmäisen tärkeä, 3 = no jaa, 1 = jopa haitallinen	
Strategiatyön versionhallinta	5 4 3 2 1
Keskusteluryhmät (News group –tyyppiset)	5 4 3 2 1
Keskusteluryhmät (Chat-tyyppiset)	5 4 3 2 1
Päiväkirja, johon kummi tai konsultti voi kommentoida	5 4 3 2 1
Kirjallisuusluettelo, jossa lyhyet esittelyt mukana	5 4 3 2 1
Linkkikokoelma, jossa lyhyet esittelyt mukana	5 4 3 2 1
Tietolomake kustakin osanottajasta	5 4 3 2 1
Oma henkilökohtainen dokumenttiarkisto	5 4 3 2 1
Ryhmän yhteinen dokumenttiarkisto	5 4 3 2 1
Sähköpostityylinen viestien lähetysmahdollisuus	5 4 3 2 1
Ryhmän suunnittelukalenteri, jossa sovitut määräajat ym. näkyvissä	5 4 3 2 1
Ryhmän ilmoitustaulu	5 4 3 2 1
Ilmoitustaulu koko kurssille	5 4 3 2 1
Materiaalipankki, josta kaikki kurssiin liittyvä materiaali löytyy	5 4 3 2 1
Liiketoimintasimulaation toteutusympäristö, jossa mahdollisuus tutkia jälkeenpäin päätösketjuja	5 4 3 2 1
Palautteenantopaikka workshopeista	5 4 3 2 1
Oppimistavoitteiden kuvauspaikka	5 4 3 2 1
Paikka ilmoittautua ja tehdä oppimistyyli- ym. testit	5 4 3 2 1
	5 4 3 2 1
	5 4 3 2 1

Kommentteja:

2 Summary of the questionnaire results

The actual form was in Finnish (see Part 1). In the following the texts are translated. The free comments given are presented both in English (translation) and in Finnish. 28 forms were returned

	Number of different values given in answers					
	1	**2**	**3**	**4**	**5**	
There was not enough coaching for teamwork	1	9	**15**	2	1	There was too much coaching for teamwork
We were able to work well as a team	6	**11**	6	5	0	We were not able to work well as a team
There was not enough couching for presentations (especially for the final presentation)	0	9	**16**	3	0	There was too much coaching for presentations
Time period reserved for the strategy work was too short	0	1	**15**	10	2	Time period reserved for the strategy work was too long
The goals of the strategy projects were given well and clearly enough	6	**8**	7	6	1	The goals were not understood until the evaluation workshop
The contents of IBS were really needed	6	**12**	4	4	1	I can maybe apply the learning results of the IBS some day in future
I would have liked to have some kind of intermediate course before IBS to be able to get the full benefit of it	0	3	**19**	3	3	IBS was too easy, more challenges needed!
I would have needed more to read about the issues dealt with	1	5	**19**	3	0	The was too much material to read in the IBS
I studied only during working hours	0	2	**12**	**12**	2	I studied only during my free time

Comments:
You were supposed to be as creative as possible, but the guide told us to hold our horses => then the feedback was that we did not use our imagination enough => was this done on purpose (Työssä piti irrotella, mutta koko ajan "painettiin alas" sparraajan puolelta => sitten palaute, että ei irroteltu => tehtiinkö tämä tarkoituksella)
A really good entity (Tosi hyvä kokonaisuus)
More training for being on stage and an intermediate course or at least some lectures focusing on the subject (enemmän esiintymiskoulutusta ja väliporras tai ainakin muutama tarkentava luento)

I have had one or more presentation in my unit about what I have learned in IBS	Yes **12** No **16**
I have told my colleagues about ideas I got from IBS	Very much **11** Little **16** Not at all **1**
When enrolling it would be good to have a rough description of how much time is needed for various parts of the course, and the superior should permit using time.	I agree **25** Unnecessary **2**
Making a business plan should have a learning module of its own	Yes **24** Not needed **4**
If it were possible to study cases independently under the guidance of a tutor, I would use the opportunity	Absolutely yes **3** Maybe **23** No **1**
The strategy workgroup should have outsider feedback about its work as a team	Absolutely **12** well… **15**
There should be more guidance sessions for strategy projects	Yes **12** **7** No **9**
An ideal length of a guidance session is	average **2,0** hours
An good number of guidance sessions during the strategy work process	is **4,0** (average) times
Literature hints about different subject areas should be available	Plenty **9** Selected **17** No need **2**
I would like to have more discussion with my superior how to utilize the learning results at work	Yes **19** **2** No **7**
I would like to have more discussion with my superior on my future personal development	Yes **19** **2** No **7**
We were not allowed to work as a group independently enough	True **1** **2** Vice versa **25**
I got my ideas presented sufficiently in group work	Yes **25** **1** Not exactly **1**
The best time for the intermediate reporting is when	**59** (average)% of the time reserved for the strategy works has elapsed.
I worked	**37** % (average) of the time at home

Comments:
Because doing the strategy work was finally the best part in training, further studies could be based on ex IBS students' strategic working on subjects given by the management. (Koska strategiatyön tekeminen oli kaikenkaikkiaan parasta koulutuksen antia, jatko-opiskelu voisi pohjautua pelkästään johdon antamien aiheotsikoiden strategiseen työstämiseen IBS:n käyneiden kesken.)
more books (kirjoja lisää)
the group must get more feedback on the strategy project – six people used an enormous amount of time on it. It would still be nice to have more feedback. (strategiatyölle pitää saada enemmän palautetta – 6 ihmistä pisti aivan älyttömästi aikaa siihen. Eli olisi vieläkin kiva saada lisää palautetta.)
shorter period of time for strategy projects. Not even in reality does strategy project take this long! (strategiatöille lyhyempi tekoaika. Ei todellisuudessakaan strategiaa väännetä näin kauaa!)
lobbying (referring to telling about IBS subjects in learner's own organizational unit) (Käytäväkeskustelua (viittaa IBS-asioista puhumiseen omassa yksikössä))
the course about preparing a Business Plan could also be an overall course which is not bound to the IBS (Voisi olla (Business Planin tekokurssi) myös muu yleinen kurssi, jota ei sidottu IBS:ään)

the summaries (literature summaries) are good, but they come too late if one had wanted to utilize them in strategy work. (Referaatit ovat hyviä, mutta ne saadaan osittain liian myöhään strategiatyön kannalta, jos niitä haluttaisiin hyödyntää työssä.)
part of my thoughts were presented in bullet lists in the final presentation, and these lists could have been opened more (referring to the question about how participants got their ideas through) (työstä johtuen osa (omista) ajatuksista oli esillä (lopullisessa työssä) ranskalaisilla viivoilla, joita olisi voinut avata enemmän (viittaa kysymykseen "sain ajatukseni esille"))
are reports and strategy work (referring to the question about how much work was done at home) and studying different things here? (onko tämä (viittaa kysymykseen "Kaikesta tekemästäni työstä tein kotona") eri asia kuin opiskelu? (tarkoittaen lähinnä kirjallisuusreferaatteja ja strategiatöitä)
the business game (simulation) could last throughout the course. (Business peli voisi kestää koko kurssin ajan)

Estimate the usefulness of the following functions of an electronic learning environment in IBS (user interface and technical functionality are presumed to be excellent): 5 = very important, 3 = insignificant, 1 = even adverse	average values
Store for every kind of material related to the course	**4.1**
Version management of the strategy work	**3.7**
Common document archives for the group	**3.7**
Bulletin board for the whole course	**3.7**
Planning calendar for the group where all the deadlines agreed etc. are visible	**3.6**
List of literature references including short introductions	**3.5**
Bulletin board for the group	**3.5**
An environment for the business simulation where it is possible to examine the chains of decisions afterwards	**3.4**
Collection of links including short introductions	**3.4**
Information about every participant in the course	**3.4**
Possibility to send messages (like e-mail)	**3.3**
Site to give feedback on the workshops	**3.3**
Site to enrol and do the tests (learning style etc.)	**3.3**
Student's diary which mentor or consult can comment on	**3.1**
Site to describe the goals of learning	**3.1**
Personal archives for documents	**2.8**
Discussion groups of news group type	**2.7**
Discussion groups of chat type	**2.6**

Comments:
Functionality difficult to identify (Toiminnallisuus vaikea hahmottaa)
Did not work!! (Ei toiminut!!)
How to handle marketing? Threshhold unnecessary high. There should maybe be more focused training/shared use at the beginning. It is difficult to comment because it was not used much. User interface/structure too "chic"? (Kuinka hoitaa markkinointi? Kynnys turhan korkea . Alussa pitäisi ehkä olla tarkempaa koulutusta/yhteiskäyttöä. Vaikea kommentoida, kun ei paljon käytetty. Käyttöliittymä/rakenne liian "chic"?)
Find out the 1-5 most important functions from the user's point of view and concentrate on those, others are minor points and they should be hidden. (Selvittäkää 1-5 käyttäjän kannalta tärkeintä toimintoa ja toteutuksessa keskittykää niihin, muut ovat sivuseikka ja ne pitää piilottaa.)
It should be simple and fast, drag & drop style document transfer should be made possible on the virtual desk, pay attention to the background coloring (oltava yksinkertainen ja nopea, työpöydältä "drag & drop" tyylinen dokumenttien siirto mahdollistettava, taustavärityksen huomio)

Did not use too much (ei tullut juuri käytettyä)
e-mail & attached documents 2 (meaning probably that this student was not satisfied with the conventional method their group used) (sähköposti & liitedokumentit 2 (arvosana 2 ilmeisesti heidän käyttämälleen menetelmälle))
The learning environment implemented this way is suitable for learning at school. When learning simultaneously with one's work the system is inconvenient (Oppimisympäristö tässä muodossa soveltuu kouluoppimiseen. Työn ohessa oppimisen kannalta järjestelmä on haitallinen.)
The use of the learning environment did not quite start off even if the idea as such is good. I do not quite know what the reason is, I would have been more ready to use it but because the group was not => it was not worth using. Document management by using www applications/user interfaces is not very pleasant. (FLE:n käyttö ei oikein lähtenyt, vaikka ajatus sinänsä on hyvä. En oikein tiedä mistä johtuu, itse olisin ollut valmiimpi käyttöön mutta kun ryhmä ei ollut => ei kannata käyttää. Dokumenttien hallinta www-sovelluksin/käyttöliittymällä ei ole kovin miellyttävää.)
Information about trainers also in the learning environment (Kouluttajista myös tietolomake FLE-ympäristöön)

Appendix 6

Typical questions used in the interviews of the students

(IBS = Internal Business School)

- Which were the biggest mistakes in your strategic project?
- Which kind of guidance would have given the same learning in an easier way?
- What was the best advice given by the guide?
- What was the best advice given by the mentor?
- What was the best advice given by the facilitator?
- How could you apply the IBS-kind of guidance in everyday working life?
- What did not work in guidance?
- Where did you consciously disobey instructions and why?
- What in general was the best added value given by the guide? And the mentor?
- Do you think you were able to make good use of the guide and mentor?
- How many of the ideas you used in your project came from the guide, mentor, and from yourself? Did you get ideas from the other participants of IBS?
- What could be done to make better use of the guide and mentor?
- What could be done to make better use of your superior?
- Who else could guide you in your personal development and in networking, and how?
- What should be improved in guidance at IBS?
- Would you have liked more personal guidance?
- Was the group guided too strongly?
- How did each participant affect the final result?
- Was anything left out which you would have liked to publish?
- How could you have done an even better strategic project?
- Have you been able to use what you have learnt?
- Why did you participate in the course?
- Did you agree on the goals of the course with your superior?
- What have you agreed with your superior about how to use the learning results?
- How actively has your superior observed the progress of IBS?
- How often do you discuss your personal development with your superior? How often would you like to have that kind of discusions?
- Did you succeed in bringing your best expertise and/or questioning to the support of the group?
- Could better guidance somehow have been able to improve the results of the group?
- Were you allowed to speak sufficiently?
- Did you listen to each other sufficiently?
- What kind of tools could be used to support learning (mental or physical)?
- What slowed down or prevented learning?
- Have you been able to apply the issues presented in the workshops? Which workshop was especially useful?
- How different was the activity between the group members?
- How were the participants who lived farther away able to participate in the group meetings? What tools would have been needed to make the situation easier?